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Natural Disasters and Built Environment: An Ethnography of Destruction Caused by the Earthquake (2005) in Balakot, Pakistan

Ghazala Rafi[1] & Syed Sami Raza[2]

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Corresponding Author: Ghazala Rafi ghazalarafi@icp.edu.pk

Abstract: This article explores the vulnerability of the built environment of Balakot valley. The geological location of the valley at the junction of several fault lines and the two larger tectonic plates makes it vulnerable. When the earthquake of 2005 struck the valley, massive destruction was caused because the built environment had not evolved in comparison to the vulnerability faced by the valley. In this article, we employ an ethnographic method to study the built environment in the valley and shed light on the causes of destruction.

Keywords: Earthquake, built-environment, destruction, Balakot, Pakistan.

Geology of the 2005 Earthquake

The earthquake occurred on the morning of October 8, 2005, at 8:50:40 a.m. local time (3:50:40 GMT). It had a magnitude of Mw = 7.6. The earthquake occurred along the Main Mantle Thrust (MBT), the Balakot-Bagh fault line. The quake's epicenter was located about 10 kilometers east of Balakot and about 19 kilometers northeast of Muzaffarabad in Azad Kashmir, Pakistan. Forty-seven aftershocks of magnitude more than five were recorded (Zaré et al., 2009, p. 327-329)in the first month after the main event. The second jolt was vertical, and the buildings fell down on people and crushed them (Qasim, 2005).

The region's geology suggests that for the past 30 to 40 million years, the two big tectonic plates, Indian and Eurasian, have been colliding against each other (Aitchison et al., 2007). The faults in this region include Balakot-Bagh Thrust, Main Boundary Thrust, Punjab Thrust, Kashmir Boundary Thrust, and Riwat Thrust. The 2005 earthquake occurred along the Main Boundary Thrust. This thrust is also known as the Balakot-Bagh Fault/Murree Fault or Muzaffarabad Fault. When it comes close to Balakot, the fault turns steeper in the north, and it turns a trend north-south and dips steeply westward to the District of Bagh in Azad Kashmir (Mahmood et al., 2022, p. 2).

[1] Assistant Professor, Department of Political Science, Islamia College, Peshawar. Email: ghazalarafi@icp.edu.pk
[2] Associate Professor, Department of International Relations, University of Peshawar. Email: samiraza@uop.edu.pk

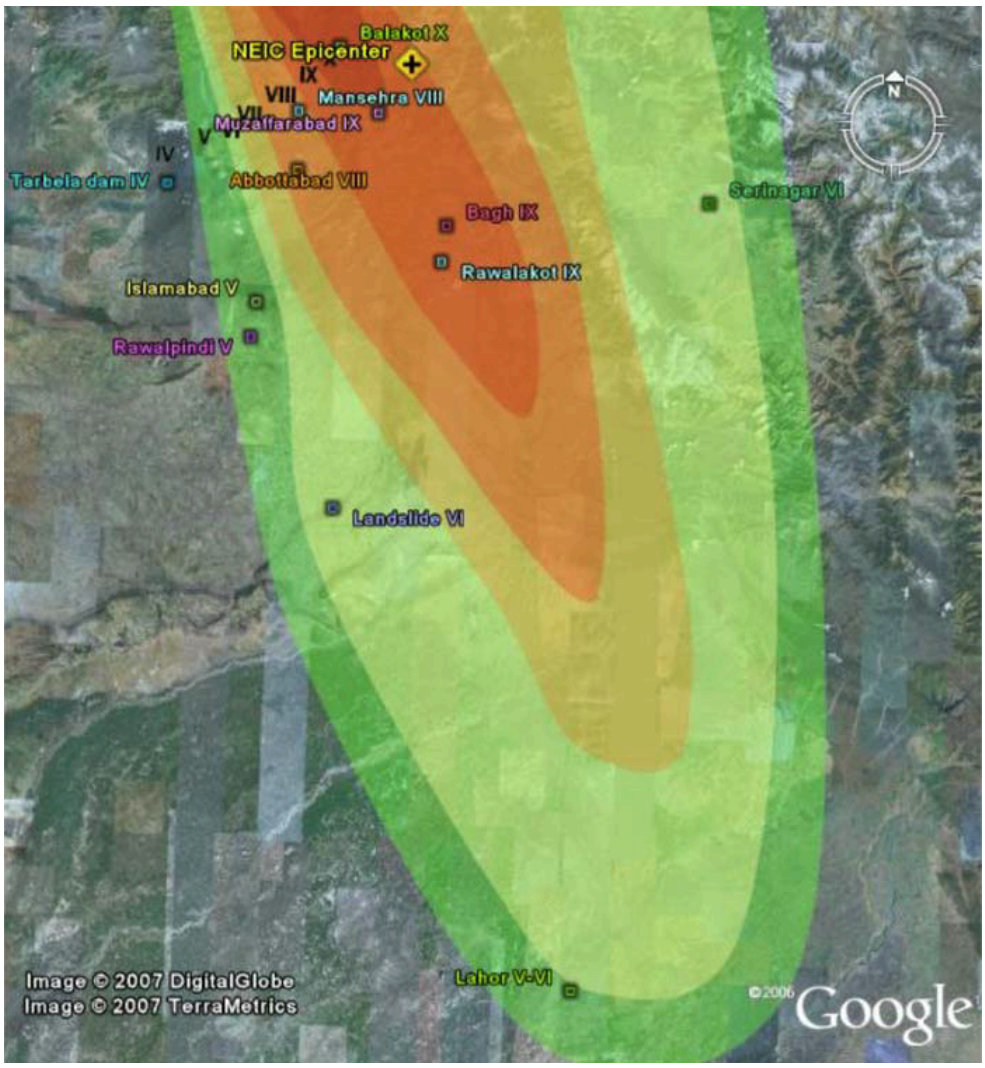

Fig. ISO-intensity map generated by IIEES reconnaissance team (Dr. Eshghi and Dr. Zaré, Nov. 2005) on EMS-98 scale (Zaré et al., 2009, p. 331).

The tectonic plates in the region are active. An estimated 16-kilometer-long active Faultline has been mapped in this region during the course of mapping active faults in Pakistan (Kaneda et al., 2008, p. 523). The tectonic activity means that the area is prone to earthquakes in the future. Due to the active tectonic setting, this region is still prone to destructive earthquakes. This region lies in the northwestern part of the Himalayan Frontal Arc. Seismologists have recorded between 1897 and 1952, along the Himalayan convergent plate margin, 14 major earthquakes of magnitude more than Mw 7.5 and five earthquakes of magnitude more than Mw 8 (Zaré et al., 2009, p. 329). The town of Balakot is above multiple fault lines that cross the region (Mahmood et al., 2022, p. 2). That is why it is one of the most vulnerable towns in the region. However, it should be noted that at the beginning of the 20th century, the colonial British Gazetteers wrote, "Earthquakes, though of not infrequent occurrence, have never been of a really alarming character" (Watson, 1908, p. 16).

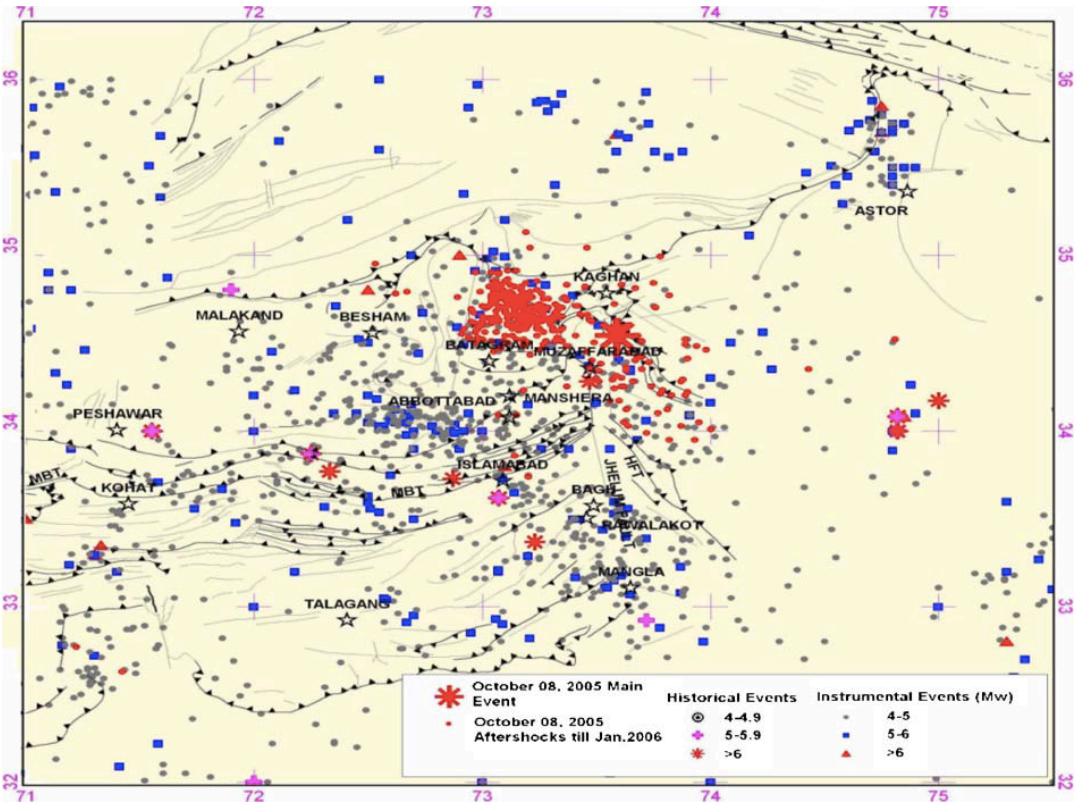

Fig. Seismotectonic setting of the area of the 8 Oct. 2005 earthquake. The red dots are the aftershocks of the mainshock (Zaré et al., 2009, p. 328)

Earthquakes are motions produced in the ground. They result from the release of the abrupt strain of energy that builds in rocks over long periods of time (De Blij & Muller, 1996). Most of the earthquakes occur due to the abrupt movement of the ground near the fault planes in the crust of the Earth (Alexander, 2001). In the subsurface environment, rocks disintegrate under pressure, and rocks on both sides of the fault rebound to their initial positions, causing earthquakes (Biggs et al., 2010). The science of seismology is about elastic waves that study the origins and propagation of earthquake shocks (Alexander, 2001).

The Geological Survey of Pakistan gave a seismic hazard zonation map of Pakistan before 8 October 2005. In this map, the Balakot valley lies in a moderate hazard level. However, after the earthquake, the hazard zonation map of Pakistan has been revised. Balakot and Kashmir have been placed in high seismic hazard zones. Accordingly to geologists, in order to make the hazard zonation map more accurate, there is a need to incorporate active tectonic units and advanced seismicity parameters (Zaré & Karimi-Paridari, 2008).

3.2 Destruction of the Built Environment

The areas most destroyed by the earthquake of 2005 included the Kashmir valley and the larger Balakot valley. These valleys and mountains host a large population of about 5.7 million. The life of the people in this

region is mostly rural, with firmly socially knit families that have intermarriages throughout the region. An average family in this region constitutes about seven households. Much of the population lives in the mountains, forming villages and communities. However, much of the density in population is visible in the valleys along the river sides and highways, where small villages have by now grown into dense towns. About 88% of the population, however, is estimated to be living in the mountains or own houses there. The mountain communities are spread out with a range of 2 households to more than 300. Much of the population is young. It is estimated that before the earthquake, 42% of the population was below the age of 15 and only 6.7 % was above 60 (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

The Government of Pakistan requested a mission led by the Asian Development Bank (ADB) and the World Bank to carry out a preliminary damage and assess needs for rehabilitation. The team formulated an assessment estimate of the damage and reconstruction costs in Balakot and adjacent areas. Apart from Balakot, which was completely destroyed, Muzaffarabad, Bagh, and Rawalakot were severely affected. From Mansehra and Abbottabad to Kabul, the towns and cities were affected and suffered losses. In Islamabad, a high-rise of 10 floors, Margala Tower, collapsed. The earthquake circle was wide enough to reach the southern parts of Kashmir in India and the eastern parts of Afghanistan. The earthquake claimed a large number of casualties, about 80,000 (Zaré et al., 2009, p. 328).

The town of Balakot was one of the most destroyed towns in the region. The massive earthquake completely destroyed the town. On the European Macroseismic Scale (EMS-98), the Balakot region was assigned the intensity level of X. The intensity level showed that all buildings in the valley and mountains were completely destroyed. The measure of complete destruction was also assigned with the measurement of the dislocation of Balakot's main river bridge by 1 meter (Zaré et al., 2009, p. 333). A report by the Asian Development Bank and the World Bank estimated that about 73000 people died, 70,000 were injured, and around 2.8 million people were displaced or left without shelter. They further reported that in addition to the human deaths, the earthquake and its aftermath posed a large cost to Pakistan, which is estimated at approximately US$5.2 billion. This includes the costs for relief, livelihood support for victims, and reconstruction (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005, p. 2)

The earthquake caused about 10,000 deaths and erased 90% of the infrastructure in Balakot town. However, the magnitude of destruction around the main town is not as great as in the town due to the sparsely populated areas. Balakot, which runs along the main road over the river, bore more destruction and death as it was densely populated and had a congested built environment. Balakot City, Garlat, Ghunool, and Hassa are the worst-affected areas. Some of my interviewees among the local people said that the destruction was so massive that it seemed that life would never be possible again in Balakot. The level of destruction was such that the initial reports declared both the Union Councils inhabitable. However, no notification has been issued

to prohibit the reconstruction of the government. Both the Union Councils were to be relocated to the new Balakot City at Bakriyal.

Moreover, the town of Balakot saw large landslides due to the earthquake, which shows that it remains also vulnerable to landslide hazards. These landslides increased the impact of earthquakes in terms of destruction and loss of the built environment and lives. Most of the old traditional mud and wood houses in the mountain slopes that were affected by landslides due to the 2005 earthquake were buried under massive debris.

The social and economic factors that subject people to the risks of earthquakes include population growth, urbanization, economic growth, increasing building, and poor communication. Similarly, the people concentrated in poor communities, whether in urban or rural areas, are more vulnerable to earthquakes (Adelekan et al., 2015). Some scientists write that people in developing countries and poor communities are more affected by earthquakes because they have low access to the resources needed to deal with disastrous conditions caused by earthquakes (Blaikie et al., 2004).

3.2.1 Impact on Public Infrastructure:

Despite the fact that the public buildings and other infrastructure were *pukka* (concrete), they couldn't withstand the jolts of the earthquake. Since colonial times, the public infrastructure has been built on certain standards of construction. These involved proper construction tenders, bids, and instructions about materials and layout. These buildings were made of concrete, bricks, and steel. However, in the field interviews with contractors and the works department, it turned out that before the earthquake of 2005, the government did not include any requirement of earthquake-resistant architecture and buildings. In the government tenders, they said there was no requirement for making such earthquake-resistant construction. When asked about the reasons why the government didn't ask for earthquake-resistant construction, we got a number of answers. Some believed that the government would not invest so much money in building such high-quality constructions. In the works department, we also got the reason for the lack of such architectural plans and technology available in government departments at the time. One respondent also asked why the government would spend so much money in a far-flung area when they don't make earthquake-resistant buildings in big cities.

The public infrastructure was among the rubble that Balakot saw in the earthquake. Here we would write about the buildings and other infrastructure that we observed during our fieldwork. In the main town of Balakot, the buildings of the local courts (kachiri) collapsed. These buildings were also made of concrete. Judges, lawyers, and other staff were stuck in the rubble. Later, the family of a deceased lawyer sued the contractor for making buildings that were not earthquake-resistant. The government-owned Pakistan Tourism and Development Corporation's, PTDC, hotel also collapsed. This hotel was made on the bank of the river

Kunhar near the main Balakot bridge. Parts of the hotel went into the river. This hotel was made very close to the river, though the government's rules relating to construction on the banks of rivers don't allow such construction. Later, the new building of the hotel was made across the road and quite a distance from the river. Balakot's general hospital was also made of a concrete structure, but had a tin roof. The hospital collapsed, leaving many staff members and patients trapped inside. Balakot's High School for Boys also had a concrete building. This school had hundreds of students who were attending classes.

In our interviews with the local residents of Balakot town and the community in the mountains, we have been told about the devastating impact of the earthquake. In our last visit (2024) to attend the earthquake's anniversary gathering at the Balakot High School for Boys, we were told by a respondent from Tehsil Municipal Office that the stairs that we had just climbed in the school were recently made because the ground on the one side of the school raised higher by 3 feet due to the earthquake. There were no stairs before the earthquake, as the ground was flat. This high school was completely destroyed by the earthquake, causing the deaths of 80 children whose mass grave was made on the same site. Similarly, nearby Hassa College collapsed as well, which was made of concrete.

Sharkol Primary School in Baffa-Pakhel tehsil had collapsed, and the local residents encroached upon its land by taking over it. For a decade, the encroachment went on unnoticed, or no action for recovery was ordered. In 2021, the district administration started to take notice of it and ordered the assistant commissioner to recover the land of the school ("Recovery of School's Land Ordered," 2021).

3.2.2 Impact on the Private Infrastructure:

The private infrastructure was a mix of *pukka* and *kacha* buildings. The main bazaar of Balakot had hundreds of shops, halls, community centres, including mosques, and stores. All of these buildings collapsed, including the central mosque, whose parts fell into the river. Only one building, Madni Plaza, which is almost in the center of the bazaar, was left standing. The local people had to offer a number of explanations why it didn't collapse. These explanations are not about architectural plans or materials used to build it, but about socio-religious aspects.

Private schools, hotels, and houses, both pukka and kacha, in the main town of Balakot collapsed. Shaheen Foundation School's collapse is often told to be the most devastating. It is reported that about "650 children were trapped inside the four-storey building that collapsed as the children sat in class" (Hassein, 2005). Lots of children got trapped in the rubble, and some died. In our field interviews, the local people claimed that the number of casualties was above 100. Because the school was funded by foreign donors, questions were raised about the construction and architecture of the school. The local people, especially the

parents of the children, had demanded an investigation into the collapse of the school, but no such investigation ever took place.

3.3 Impact on Local Economy

The earthquake of 2005 drastically and abruptly changed the pastoral economy in Balakot. It disrupted the barter system as well. When the earthquake struck, it resulted in certain changes in the nature of cultivated lands. For example, it resulted in changing the paths of water springs. Because of the changes in the paths of water springs, the cultivated plots and the system of waterways that people had built were left wasted. It also resulted in affecting watermills where the paths were disrupted resulting in their stopping and shortages of food. The spring water also got contaminated at places by underground disturbances to the presence of coal and other minerals. The landslides, smaller and bigger ones, resulted in destroying the cultivated *dowgees* (land plots). The destruction of houses by way of collapsing and even sliding down the mountain slopes resulted in wastage of the stored harvested crops as well as killing and displacement of cattle, goats, and sheep.

The sheds for animals easily collapsed because they were the most vulnerable, as they were normally made of mud and stones with less effort and thought, to be temporary or less important. According to one report, about 250,000 farm animals died due to the collapse of barns and sheds, and about 500,000 animals required immediate shelter in the wider region of the earthquake ("The Kashmir Earthquake of October 8, 2005," 2006).

Because the rural economy of the Balakot valley depended on agriculture and livestock, it suffered immensely. Most rural people, both in valleys and atop mountains, engaged in subsistence agriculture to feed families, as well as to barter or sell the excess. Few people are involved in small jobs in the government. However, apart from agriculture, people engage in full-time or part-time businesses and transport. Many families also depended on remittances that come from family members in Karachi or other big cities and abroad. However, for women, there are hardly any opportunities for employment. They have been mostly housewives and therefore remain at home to bring up children. They were also impacted more by the earthquake, both physically and psychologically.

According to one report, the private sector in the larger destroyed areas had enterprises and businesses ranging from small-scale to medium-scale. These businesses were run and shared by families or households together. The valleys had more retail businesses than production units, and their financial sector was also weak. Due to the pressure of population, the existing land resources were fragmenting, and subsistence agriculture was overburdened. This also resulted in migration to urban centers and abroad. Remittances are thus the crucial source of income. It accounted for approximately a quarter of the household's consumption expenditure (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

3.4 Impacts on Social and Psychological Life

The earthquake seriously impacted the social and psychological life of the people of the tehsil Balakot. These people were already economically, politically weak and vulnerable, as they lived in the far-flung valley and mountains with a rural semi-agrarian economy. There was partial to no provision of services, especially of health, utilities, and higher education. When the earthquake hit the valley, many people died because their valley was cut off from the highways and/or they did not have enough resources of their own. Because of low income and knowledge, they also couldn't make an earthquake-resistant infrastructure.

One of the social impacts was the unattended children. A big number of children were said to be left without parents and relatives. Some of these children ran out of schools, and they couldn't reach their houses. Because everyone was in panic so they couldn't get the help. There came NGOs who tried to work in this direction, but because children and local people didn't trust them, the process of reunification became slow and painful.

Another social impact was of single-headed households. The earthquake struck when many women worked inside their homes, in kitchens, or in rooms cleaning the house. While men had left their houses to work in the fields or on their way to work. This resulted in the casualties of housewives, women, and children. Losing a mother created a negative physical and psychological impact on the family's remaining children.

On the other hand, where fathers were lost, it also caused a psychological and economic blow to the family. The women of the family were left alone to earn and raise the family. Moreover, local social taboos don't allow mothers to marry again and put their children at risk. The earthquake resulted in an increase in the number of widows, single women, and women-headed households. Their access to relief or information about relief also decreased. They also faced many hurdles for their or their children's medical treatment.

Another social impact of the increasing vulnerability of women and children was the loss of official records relating to property. Because women are already vulnerable in property distribution, and local practice is to keep them excluded, especially upon marriage, the earthquake's destruction of public buildings and records increased this difficulty. The local *kachiri* (courts) building had collapsed, and we heard in the interviews that local people expressed their anxiety about the loss of records and/or potential conspiracies to destroy documents.

Yet another social impact has been the permanent physical or psychological injury caused by the earthquake. Many victims of the earthquake who were under debris and rubble got permanent injuries in their limbs, spines, and heads. They have been left disabled permanently. These victims are another group of vulnerable people. They are at the risk of being left behind socially and economically. Since some don't have other able-bodied household members to receive relief on their behalf, or their families were at risk. Moreover, as the rebuilding and reconstruction of public and private infrastructure is done, there would be a need to

ensure plans and designs in architecture to facilitate these permanently injured people. Apart from that, some permanent medical facilities needed to be set up for their long-term care and cure.

The earthquake also left a permanent mark on the individual and collective psychological life of the community. It caused severe shock and trauma among the people who lost their loved ones, or those who were permanently injured, or lost one. The society didn't have psychological centers or units in hospitals.

3.4 Life Story Account of the Destruction

In this section, we want to provide a firsthand experiential account of the local people. This account provides a more human dimension of feelings and emotions, loss and trauma, attachment and dislocation.

Sultan Awan was one of the prominent government contractors. He had made several public buildings, including schools, colleges, bridges, etc. He had a growing business in the construction industry in Balakot before and after the earthquake. In my interview with him about his experiences of the earthquake, he told me his shocking story, which I found relevant in many ways for supporting the arguments made in this dissertation. Sultan had a contract to make a school building in a village atop a mountain. He was on the construction site when the earthquake shook the mountains. Sultan fell down on the ground and held on to a rock for support. The shake was so immense, the second one, that it had thrown his construction worker feet away. As the shake passed, he saw around him a storm of dust rising from all sides. There are women and children crying. People from the fields (*dowgees*) of corn were running toward their houses. There were men shouting for help.

Sultan thought of his own family. He had married three women and had about seven children. His family lived in a nearby village of Ganool. He was scared. As he began to rush toward the road to find his jeep to drive down the valley, he couldn't. The road had cracked and landslides had filled it with mud and rocks. The rocks were continuously falling and the dust made the way invisible. Sultan said that he was not deterred by the obstructions on the road, but by the cries and wailing families that needed help. He said he wanted to help them, but then the thought of his own family stopped him. Everyone was rushing to their own families. His construction workers had run away in different directions. With great effort and facing the great dangers of sliding and the falling rocks, he made it to the valley. Here, he hoped he would be able to catch a jeep that could take him to his village and family. He said for hours he couldn't find any jeep, so he kept on walking and running. At some point, he received some drive, but the road was so much damaged that he thought he could do it himself, walking and running.

After a couple of hours, he reached his village. As he climbed up the mountain, the first house was that of his older daughter, who was married. He stopped there for a while to see that the house had collapsed. He said he dug up the debris and rubble of the house to extract the bodies. A child was crying under the rubble. A

heavy log (*shatir*) and the ceiling had fallen on them. The mother was dead, while she had saved her child under her. Sultan took out the injured child and left the rest of the dead there. He said there was no time, I couldn't stop here. I had to reach my own family. He climbed further up the mountain to his own house. Parts of the house had collapsed, but he and his wives were safe. But his older wife was not at home. She had rushed to the school where the children were attending. Sultan also rushed to the school. This was the school that he had constructed on a government contract. It was a two-floor building atop the mountain, but almost on the edge. When he reached there, he was shocked. His wife and lots of other parents were at the school site. But the building was not there. It had slid down the mountain into the ravine, taking with it dozens of children, including four of Sultan's children. Sultan couldn't see the children or the remains. He went down many times to find the remains, but didn't. He remained psychologically so much disturbed that he would often go to the ravine to see his children. The building he had constructed with his own hands, he said, betrayed him.

With his children gone and the house falling, he couldn't live in his ancestral village. The place haunted him, and the doctors recommended that he change his residence. He brought his family to Mansehra, where he bought land and constructed a new house. He said he would not even live in the makeshift tent houses in Balakot as the stories of death and destruction disturbed him. Secondly, he didn't want his family to live in the makeshift tent housing where people were complaining about problems of purdah for women, the safety of children, and the lack of sanitation.

3.5 Public and Private Sectors' Rescue and Relief Response

i) Community-Based Organizations:

In our field interviews, the predominant response of the interviewees was about the brave efforts made by the local community-based organizations, especially the religious fraternities affiliated with mosques and madrassas. The young men of these fraternities were the first to reach the destruction sites with whatever tools they could bring. Small social fraternities from the towns of Mansehra also rushed to Balakot. They carried water and food. They transported injured people. However, because the disaster was enormous, thousands of people had to be rescued, and millions had to be moved out, it was impossible for them alone to do all that.

ii) Government's Response

The second immediate response came from the government, as the Armed forces were moved into action. Our field respondents, however, said that the government's response came several hours late. Some said that it was not until later afternoon that we could see some military helicopters and vehicles moving toward the town. They said it might be because the roads were broken at different places due to cracks and sliding. Interestingly, the initial efforts by the local people were hampered because of the arrival of the army's rescue teams. This is

perhaps, they say, because the armed forces considered the local people without enough training to rescue and also because they worried about their safety.

The President and Prime Minister of Pakistan visited Balakot next day to show solidarity with the people. Their visit was also crucial to generate funds. The government ordered two Divisions of the army to move into the destruction sites in Balakot and AJK. They set up five staging posts from where relief goods could be distributed to the people. In order to reach the far-flung villages atop mountains and deep into valleys, the government engaged helicopter operations. According to one report a fleet of 125 helicopters had carried out more than five thousand rounds to different inaccessible parts to provide relief goods and other tools for helping with rubble (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

The government immediately set up a relief fund under the name of President Relief Fund to mobilize government and private resources for providing relief. On the other hand, the Prime Minister designed a 12-point strategy for coping with the disaster and providing relief and reconstruction. The federal government also gave a directive to set up the Relief Commission, headed by a Relief Coordinator. The commission was given the role of coordinating the government's efforts to collect and provide all the relief goods and medicines. Moreover, the President also established an institution for dealing with the long-term effects of the earthquake called the Earthquake Reconstruction and Rehabilitation Authority (ERRA). This institution was supposed to oversee the provision of funds and aid to reconstruct public and private infrastructure and ensure rehabilitation.

Within a month, the government was able to mobilize considerable resources and provide emergency relief. According to the ADB report, the government provided 350,000 tents, 3.2 million blankets, and 3000 tons of medicines, and it also put together makeshift villages for the homeless. Civil and army medical teams and paramedics were also brought to the destruction sites, and more than a dozen units were created to provide medical relief. The government also announced to provide compensation to relatives of the deceased and injured, 100,000 and 50,000, respectively (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

iii) Private Sector

The private sector, which includes different companies and private businesses, also rushed to the help of the people in Balakot. Some provide cash amounts to the people, and others provide in-kind. For example, telecommunication companies set up free booths to call the affected persons. They also made their service free in the area in order to facilitate the rescue efforts. In my dialogues with the local businessmen, I was informed that private businesses brought in free food materials, like flour, oil, milk, water, and so forth. They said we normally used to buy and sell this stuff, but then the distributors were bringing it for free to the affected people.

iv) Civil Society

Pakistan's civil society has always provided generous donations and helping hands whenever a disaster has struck. This is a commendable feature of the society that they provide help without caring for any of the social, economic, and political divisions. The people of Karachi were the most generous of all, which we heard from the local people in the fieldwork more often. People from across the country sent their donations. Especially Pakistanis living abroad sent much relief.

Civil Society organizations gave enormous response to the efforts for relief. They included the Edhi Foundation, the Agha Khan Foundation, the Red Crescent Society, Save the Children, Oxfam, World Vision, Mir Khalil ur Rehman Foundation, and Islamic Relief, to name a few that people still remembered in the field. According to the ADB report, these organizations were able to provide a relief amount worth $100 million (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

v) Foreign Response

Just as the civil society of Pakistan provided generous support to the relief efforts, the international community also pledged a generous amount of cash and in-kind relief and rehabilitation help. In a month's time, the government of Pakistan was receiving pledges amounting to more than $2.5 billion according to an ADB report. About 83 bilateral and multilateral assistance pledges were made by donors, which would also provide technical staff, logistical assistance, and know-how.

The world's international institutions also stepped in to provide assistance. The World Bank provided supplemental funds of $200 million. The United Nations came forward to engage its United Nations Disaster Assessment and Coordination (UNDAC) team to help assess the nature of the disaster and the extent of damage, and to coordinate with the provision of relief by providing its expert know-how. UNDP provided assistance in the redevelopment of the area; UN Food Program engaged in providing clean food and water to the people; UNICEF made arrangements to provide education in makeshift tent schools, and UN Population Fund also provided relief in various efforts (Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment, 2005).

Conclusion:

One participant from Garlat, an electrician by profession, said: "The place became so scary that I thought the dead would be walking everywhere. It seemed like a graveyard. We never thought we would survive here again." The people thought the Day of Judgement had perhaps arrived. Much of the built environment collapsed. Most government buildings, including hospitals, police stations, courts, high schools, and colleges in Balakot and Garlat were the most affected and raised to the ground. According to scientific reports, the level of destruction was X, i.e., complete. Except for one building in the main town of Balakot, nothing survived. Houses,

hotels, and mosques all fell, some onto the ground and others slid down into ravines and rivers. On the mountain tops, almost all the houses and public buildings had collapsed as well. The congested built environment caused massive deaths, injuries, and misery.

The Geological Survey of Pakistan gave a seismic hazard zonation map of Pakistan before 8 October 2005. In this map, the Balakot valley is shown to lie in a moderate hazard level. However, after the earthquake, the hazard zonation map of Pakistan has been revised. Balakot and Kashmir have been placed in high seismic hazard zones. Accordingly to geologists, active tectonic units and advanced seismicity parameters (Zaré & Karimi-Paridari, 2008) need to be incorporated to make the hazard zonation map more accurate. The 2005 earthquake became a reference point for the local people to define how it changed their lives. Balakot was exposed to INGOs and NGOs, and also to researchers. The government of Pakistan established a disaster management authority, the Earthquake Rehabilitation and Reconstruction Authority. Also, the teaching and research departments of disaster management were established at universities. The United Nations now observes 8 October as Disaster Risk Reduction Day.

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