

Deutsche Task Force für Erdbeben

Field Missions to Pakistan after 2005 Earthquake

2005 schloss Syed Tariq Maqsood erfolgreich das Masterprogramm Natural Hazards Mitigation in Structural Engineering (NHMSE) an der Bauhaus-Universität ab. Im selben Jahr reiste der gebürtige Pakistani als Mitglied der Deutschen Task Force Erdbeben nach einem schweren Beben in sein Heimatland, um die Schäden zu begutachten. Im vergangenen Jahr flog die Gruppe erneut nach Pakistan, um sich ein Bild vom Wiederaufbau zu verschaffen. Im »bogen« berichtet Syed Tariq Maqsood von seinen Eindrücken.

German Task Force for Earthquakes (GeoForschungsZentrum, Potsdam) and Earthquake Damage Analysis Center (Bauhaus-Universität Weimar) supported two field visits to Pakistan after the destructive earthquake in Northern Pakistan in October 2005.



Masonry House, Muzaffarabad

The first visit was made in October 2005 and it was a continuation of my research in the field after Masters in NHMSE from Bauhaus-Universität Weimar. The main aim of the visit was to collect the data about the damages occurred due to the earthquake.

This was the strongest earthquake in the history of Pakistan, which jolted the northern region at 08:50 local time (03:50 UTC) of 8th October, 2005. The epicentre of the earthquake was determined to be 34.493° N and 73.629° E. It had a magnitude of 7.6 with a depth of 26 km. The earthquake caused extensive damage; destruction and loss of lives over a wide region (almost 30,000 sq. km

area). Around 90,000 people died, 79,000 were injured and over 3.5 million rendered homeless. More than 1200 aftershocks were recorded till 7th November 2005. The economic loss due to the earthquake was found to be more than 5 Billion US-Dollar.

Table 1. Overview of damaged houses

District	Total Units	Damaged Units
Muzaffarabad	123,769	98,221
Bagh	59,623	55,014
Poonch	61,678	51,705
Shangla	67,003	26,482
Mansehra	203,109	74,605
Kohistan	74,087	22,745
Abbottabad	153,819	34,012
Batagram	44,585	37,369
Total	787,583	400,153

According to government figures, 19,000 children died in the earthquake, most of them due to the collapses of school buildings. The earthquake affected more than 500,000 families. More than 400,000 buildings were damaged. The destruction of about 7,000 school buildings and several hospitals resulted in further difficulties in relief operation and social rehabilitation. Adobe, stone masonry, concrete block masonry, brick masonry and timber structures are the dominant buildings types in the region. Reinforced concrete frame structures are usually constructed only in urban areas.

The major phenomena and causes of destruction of RC structures were due to



New Municipality Office, Muzaf. Fotos: EDAC



Shopping Plaza, Balakot

soft-storey effect, short-column effect, strong beam-weak column failure, lack of concrete confinement, anchorage and inadequate lap splice lengths. Improper detailing of reinforcement, low quality material and poor workmanship also resulted in the severity of destruction.

Almost 47 percent of the total building stock in the region consisted of masonry structures. The failure of most of the masonry structures were due to heavy roof, high slenderness of the load bearing walls, absence of ring or bond beams, large openings in the walls and poor quality of mortar.

The second visit was made in September 2007 to observe the reconstruction activity after two years of the earthquake. The visit was partially funded by German Academic Exchange Service (DAAD). A tour to inner city revealed that most of the damaged structures were not repaired. The repaired structures were also not up to the standards. The newly built structures were the New Municipality Office, Muzaffarabad and the Muzaffarabad University.

The members of EDAC are conducting research on vulnerability assessment of the existing building stock in Pakistan to identify the earthquake risk level in the area.

*Syed Tariq Maqsood
Earthquake Damage Analysis Center (EDAC)*

www.edac.biz