

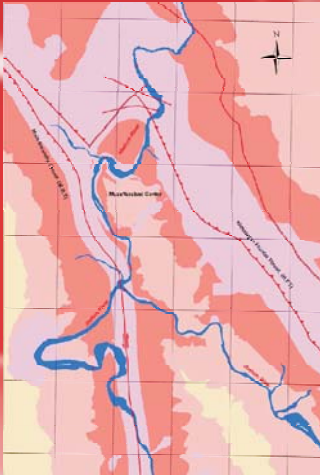
GHA

Striving For a Hazard Free Living . . .

SERVICES

HA&DM is specialized in providing the following services:

- Hazard based reconstruction and relocation suitability assessment of individual reconstruction sites based on Geologic, Seismic, Geotechnical and other site specific conditions in perspective of the intended landuse.
- Preparation and derivation of district wise seismic hazard Macrozonation maps delineating zones of similar level of Total Hazard.
- Detailed surface and subsurface Geotechnical and Geophysical Investigations for the evaluation of a wide variety of rocks and soils for foundation design.
- Neotectonic study of Quaternary Deposits to ascertain the recent activity of faults, ruptures, shears and other tectonic features of seismic significance.
- Mitigation Consultancy of Geotechnical Hazards including Landslide, Mud Flow, Debris Flow, Slope Failure, Liquefaction, Soil Creep, Avalanches, etc.
- Identification of areas suitable for resettlement and future urban development.
- RS / GIS Based analysis for the detailed study and analysis of Geologic, Seismic and Geomorphological Features for GIS based solutions for seismic risk reduction.
- Other Specialized inputs for mitigation of hazards by employing Remote Sensing and GIS based evaluation techniques w.r.t Geology, Seismology & Geotechnical Engineering.



"HFT" Surface Rupture Zone Traversed Through a Bare Rock Hillslope, NW of Muzaffarabad City, AJK

Seismic Hazard Microzonation Map of Capital City of Muzaffarabad, AJK

HA&DM HAZARD ASSESSMENT & DISASTER MANAGEMENT (HA&DM)
DISASTER MANAGEMENT AND RECONSTRUCTION DIVISION (DM&RD), NESPAK
HOUSE NO. 78, MAIN MARGALLA ROAD (KHYABAN-E-IQBAL),
F-6/2, ISLAMABAD, PAKISTAN
Telephone : (+92-051) 2826167, 2877744 Fax : (+92-051) 2820144
E-mail : gha@nespakerp.com
Web Site : <http://www.nespakerp.com>

GHA

GEOLOGICAL HAZARD ASSESSMENT

STRIVING FOR A HAZARD FREE LIVING !

Geological Hazard Assessment (GHA) serves as a basic tool in modern urban and rural development in terms of setting broader guidelines for Regional Hazard Based Land Use Management and establishing the area specific assessment of localized Total Hazard to which the given landform might be subjected through the course of time.

GHA being an integral speciality of DM&R Division of NESPAK provides specialized services for the mitigation of Geologic, Seismic and Geotechnical, existing and earthquake Induced Hazards.

GHA has a very competent and highly skilled team comprising of Engineering & Structural Geologists, Remote Sensing / GIS Analysts and DRR Experts, who have developed competence over a period of time to attain the crucial and perhaps the most gigantic task of Geological Hazard Assessment.

GHA has been serving its Clients by putting its efforts in a number of aspects including Geologic, Seismic & Geotechnical Hazard Assessment, Macro / Micro Seismic Hazard Zoning and determination of Seismic Design Parameters for more than Eight Thousand (8000) Reconstruction sites.



Balakot Bridge on Kunhar River in KPK Remained Intact But virtually Displaced



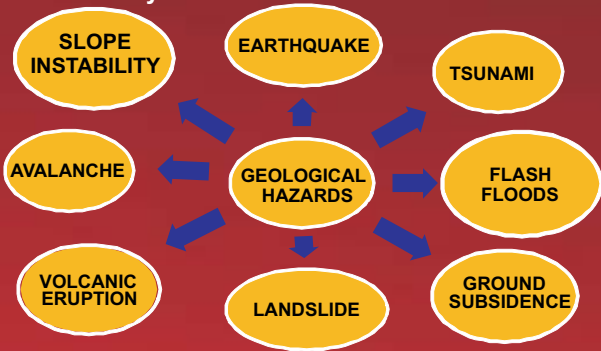
GHA caters specific guidelines to reach the most pragmatic and economically viable engineering solutions for mitigation of a broad spectrum of earthquake induced direct and indirect hazards and at the same, assures sustainable reconstruction and rehabilitation by identifying hazards and defining seismic design parameters. GHA follows the standards laid by World Institute of Disaster Risk Management (DRM).



HAZARD ASSESSMENT & DISASTER MANAGEMENT (HA&DM)
DISASTER MANAGEMENT AND RECONSTRUCTION DIVISION (DM&RD), NESPAK
HOUSE NO. 78, MAIN MARGALLA ROAD (KHYABAN-E-IQBAL),
F-6/2, ISLAMABAD, PAKISTAN
Telephone : (+92-051) 2826167, 2877744 Fax : (+92-051) 2820144
E-mail : gha@nespakerp.com
Web Site : <http://www.nespakerp.com>

GEOLOGICAL HAZARDS

All types of Natural Disasters that may originate directly or indirectly within the earth's mass comes under the domain of Geological Hazards. There is a wide variety of Geological Hazards that may result into a natural disaster of regional or localized extent depending upon the nature, type and severity.



Earthquake Hazards

- Among Geological Hazards, Earthquake Hazard has been rated to be the most devastating natural calamity incurring immense losses to lifelines, property and infrastructure damage while adversely affecting the livelihood of communities and environmental impact.
- A few major earthquakes have rocked Pakistan at different areas located within active seismotectonic zones having regional significance. These earthquakes rendered devastating consequences to society and economy.

1. 1935 Quetta Earthquake:
Magnitude 7.7 Causalities 60,000 (Approx.)
2. 1974 Patan Earthquake:
Magnitude 6.2 Causalities 53,000 (Approx.)
3. October 08, 2005 Kashmir Earthquake:
Magnitude 7.6 Causalities 78,000 (Approx.)
4. October 29, 2009 Ziarat Earthquake:
Magnitude 6.4 Causalities 200 (Approx.)



Loss of Lifelines, Balakot City



Wide Spread Earthquake Devastation



Massive Rock Fall/Slide, Neelum Valley, AJK



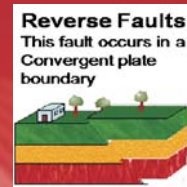
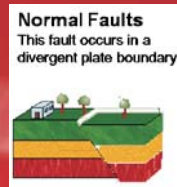
Collapsed Margalla Tower, Islamabad City

Fault Zones

A fault is a planar fracture in rock wherein the strata on one side of the fracture has moved w.r.t the strata on the other side. Large faults within the Earth's crust result from differential or shear movement, and the fault zones developed are the casual locations of most earthquakes. Energy released during rapid slip along faults generates earthquakes.

For Actualistic Hazard Based Reconstruction Suitability Assessment of Individual Sites, HA&DM Group of DM&R Division (NESPAK) has prepared Fault Zone Maps of all districts of KPK and AJK on GIS database. The information derived from these maps utilized for

- Determination of Seismic Design Parameters
- Determination of Reconstruction Suitability Assessment w.r.t intended landuse
- Delineation of Highly Hazardous Zones



HFT Surface Ruptures
Progressively Induced Massive Slope Failures - Balakot City, KPK



Earthquake Induced Earthflow,
Kaghan Valley, District Mansehra, KPK



An overview of HFT Surface Rupture Zone Traversed through hillslopes along left bank of Kunhar River, Balakot City, KPK