

Bohol Earthquake - February 08, 1990

This shallow seated tectonic earthquake with magnitude 6.8, struck the island of Bohol at 3:15 pm, caused panic to general public, damaged several houses and infrastructure and presented several geologic disturbances. Its epicenter was located about 17 kilometers east of Tagbilaran City with a maximum felt intensity of VIII, based on Rossi-Forel Intensity Scale, in the towns of Jagna, Duero and Guindulman all situated on the lower area of the NE quadrant of the island. It was felt at intensity VII in Garcia Hernandez, Loboc, Valencia and Anda, Intensity VI in Tagbilaran City, the rest among the 16 municipalities of Bohol and in the neighboring islands of Cebu and Camiguin. Intensity V was felt over areas of Cagayan de Oro in Mindanao, Dumaguete City in Negros, Intensity IV in the areas of Canlaon in Negros and Cotabato City in Mindanao. Reported felt intensities ranging from I to III was also felt as far as Palo in Leyte and Bislig in Surigao.

Observed geologic phenomena related to this event include ground fissures, landslides, rockfalls, ground subsidence and collapse, sand/mud fountaining and sudden increase on the sea level. Most of the manifestations were particularly observed and experienced by the towns of Jagna, Valencia, Duero, Guindulman and Garcia Hernandez. The force of the incoming waves from the sea caused Alijuan River in Duero to flow inland immediately after the earthquake.

Based on the orientation of the main fracture zones, focal mechanism solution and aftershock distribution, the earthquake may have represented subsurface rupture along segments of the NE-SW Alicia thrust fault. Studies by the Bureau of Mines (1986), however, point to the fact that in most portion of the fault is being overlain by Miocene to recent limestone which does not reflect any deformation suggesting that the fault has been inactive for quite a long time. This would pose a question as to whether the earthquake represented reactivation of an old fault or indicated new fault movement in the island.

Impact and damage documentation revealed that the worstly affected portion of the island was sustained by the eastern and southeastern coastal areas, observed to be mostly underlain by alluvial deposits which have tendency to amplify ground motions generated by an earthquake. Likewise, most of the damaged buildings were either old/poorly-built or lacked the necessary reinforcements to resist strong ground shaking. About 3,000 units of houses, buildings and churches were affected and damaged where a total of 182 were totally collapsed including two historical churches built centuries ago. Some 200,000 sq.m. of fishpond in the town of Guindulman sustained damage due to cracked and collapsed dikes. Mud eruptions on these fishpens contributed to the death of fishes and prawns.

The bridge connecting the towns of Jagna and Duero collapsed. Roads to Anda sustained cracks and fissuring. Landslides and rockfalls blocked some portions of the roads that caused inaccessibility to some areas between Anda and Garcia Hernandez.

Six fatalities were reported and more than 200 were injured in the event. About 46,000 people were displaced by the event and at least 7,000 among them were rendered homeless. Estimated damage to properties is amounting to 154 million pesos.

References:

Umbal, J.V., Masigla L.M., Medrano R. N. and Diolata G.P. - Report of Investigation on the February 08, 1990 Earthquake in Bohol Province. PHIVOLCS