PAKISTAN

Socio Economic Assessment of Surface Deformation due to Pasni Earthquake detected by Optical and RADAR Remote Sensing

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Pakistan is in a seismically active region at a juncture of the Indian and the Eurasian tectonic plates that strike in the area, which repeatedly leaves its inhabitants at the targets of deadly earthquakes. Further, Baluchistan province of Pakistan is a high-risk zone for crucial disasters like earthquake and tsunami in addition to droughts. Scientists have reported to look for stimulation to trigger another major earthquake since the 1935 earthquake where beside Makran, the areas of Ormara, Pasni and Somiani would be in most risk. Pasni is known as economic hub due to Pasni harbor. The Fish harbor although has made a positive impact, on the socio-economy of Pasni but it has also impacted negatively on the coastal surrounding of the harbor, by altering the hydrodynamics coastline of the area over a period of 10-20 years. Additionally, recent earthquake of 6.3 Mw on 7 February 2017 in Pasni has increased the vulnerability. This study has identified widely spread ground displacements for the Pasni earthquake using a Synthetic Aperture RADAR (SAR) interferometry analysis. Further, optical remote sensing has been used to identify the shore line changes. The interferogram revealed the deformation area where interferometric vertical displacement in different time was treated as an evidence of earthquake deformation. Profile graphs were generated to identify areas experiencing subsidence and uplift. The major displacement area lies in the eastern direction of Pasni and most surface deformation with ground displacement exceeding in southeastern and northeastern part. Severely affected areas by earthquake were marked as zones with average displacement 250 mm. It is roughly estimated that continuous shoreline changes have caused land loss annually equal to the 50 houses in the Pasni city area equivalent to 50 houses.