



## **A discussion of the socio-economic losses and shelter impacts from the Van, Turkey Earthquakes of October and November 2011**

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The Van earthquake in 2011 hit at 10:41 GMT (13:41 Local) on Sunday, October 23rd, 2011. It was a Mw7.1-7.3 event located at a depth of around 10 km with the epicentre located directly between Ercis (pop. 75,000) and Van (pop. 370,000). Since then, the CEDIM Forensic Analysis Group (using a team of seismologists, engineers, sociologists and meteorologists) and [www.earthquake-report.com](http://www.earthquake-report.com) has reported and analysed on the Van event. In addition, many damaging aftershocks occurring after the main event were analysed including a major aftershock centered in Van-Edremit on November 9th, 2011, causing much additional losses.

The province of Van has around 1.035 million people as of the last census. The Van province is one of the poorest in Turkey and has much inequality between the rural and urban centers with an average HDI (Human Development Index) around that of Bhutan or Congo. The earthquakes are estimated to have caused 604 deaths (23 October) and 40 deaths (9 November); mostly due to falling debris and house collapse). In addition, between 1 billion TRY to 4 billion TRY (approx. 555 million USD – 2.2 billion USD) is estimated as total economic losses. This represents around 17 to 66% of the provincial GDP of the Van Province (approx. 3.3 billion USD) as of 2011.

From the CATDAT Damaging Earthquakes Database, major earthquakes such as this one have occurred in the year 1111 causing major damage and having a magnitude around 6.5-7. In the year 1646 or 1648, Van was again struck by a M6.7 quake killing around 2000 people. In 1881, a M6.3 earthquake near Van killed 95 people. Again, in 1941, a M5.9 earthquake affected Ercis and Van killing between 190 and 430 people. 1945-1946 as well as 1972 brought again damaging and casualty-bearing earthquakes to the Van province. In 1976, the Van-Muradiye earthquake struck the border region with a M7, killing around 3840 people and causing around 51,000 people to become homeless. Key immediate lessons from similar historic earthquakes in eastern Turkey were developed in terms of the mass shelter and post-earthquake housing needs of the displaced population of Van. This included an analysis of shelter and reconstruction requirements under winter weather conditions; community resourcefulness in coping with housing needs through indigenous methods; and issues with in-place sheltering versus relocation and resettlement.

A summary of the losses and implications on the GDP, economic dynamics, capital stock, social structure shelter and housing needs of the region is discussed. In addition, a quick comparison to past similar earthquakes is undertaken through the use of CATDAT.