



Earth



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Damage in 2011 Van earthquake | Source- *DailyMail, UK*

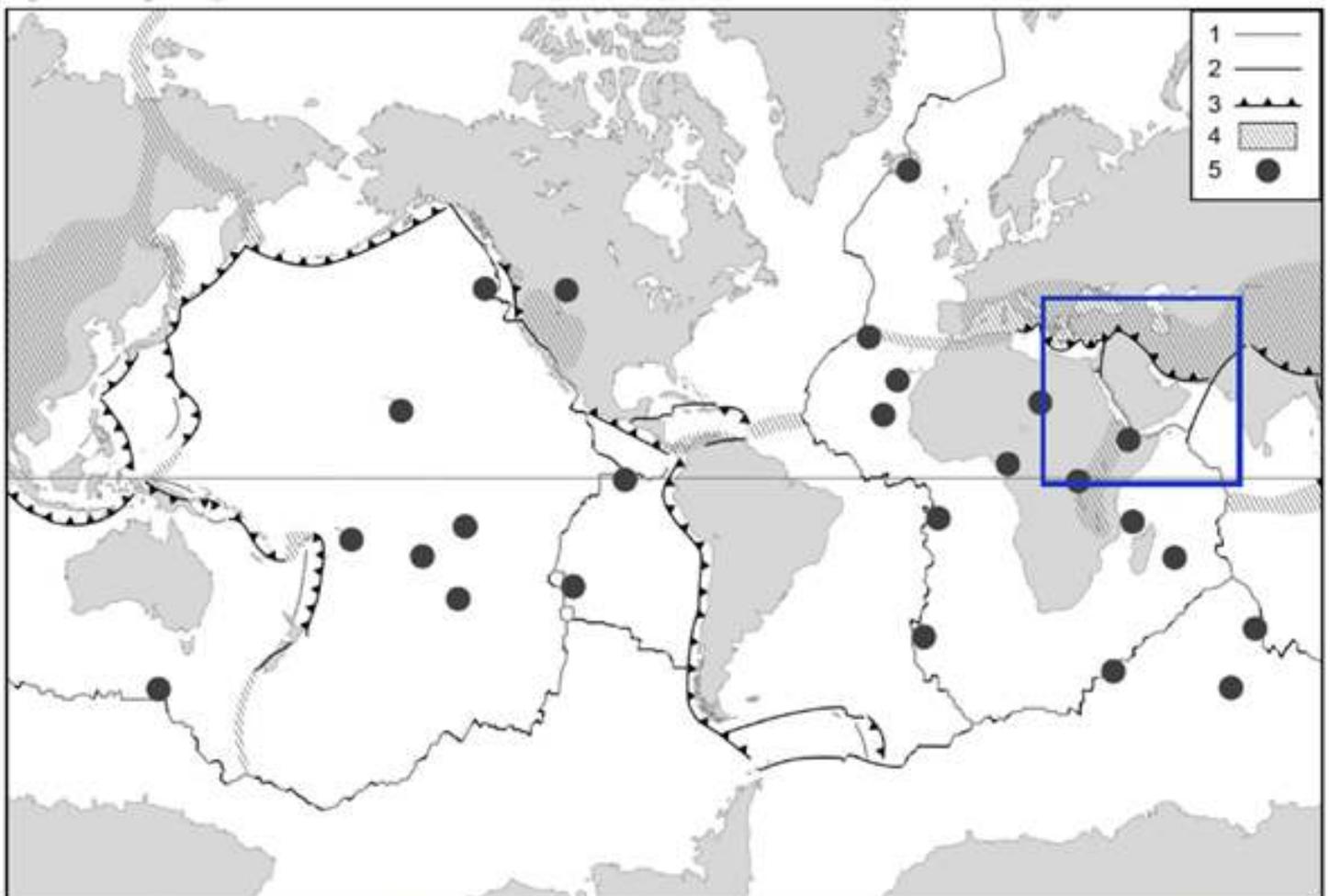
Earthquake risk in the Middle East

The Middle East region is rapidly urbanizing due to increase in economic activities. The region, previously dependent on oil, is fast becoming a service and tourism hub. According to the World Bank, among around 400 million inhabiting the region, around 56 % live in the cities and, by 2025, around 68 % population will be living in cities.

With increase in economic activities, exposure to risk including natural catastrophe risk is on rise. Flood, earthquakes, and droughts are the most common natural hazards in the region. The Lloyd's City Risk Index estimated that around US\$ 85 billion of potential economic yield among the 22 cities in the region could be at risk from earthquakes over the next decade.

Earthquake Activity in the Region

Active tectonics and seismic activity of the region has been shaped by the northward motion of the African and Arabian plate relative to the Eurasian plate. Figure 1 below shows global plate boundaries.



1: Divergent plate boundaries; 2: Transform plate boundaries; 3: Convergent plate boundaries; 4: Plate boundary zones; 5: Selected prominent hotspots.

Figure1: Source: *USGS*

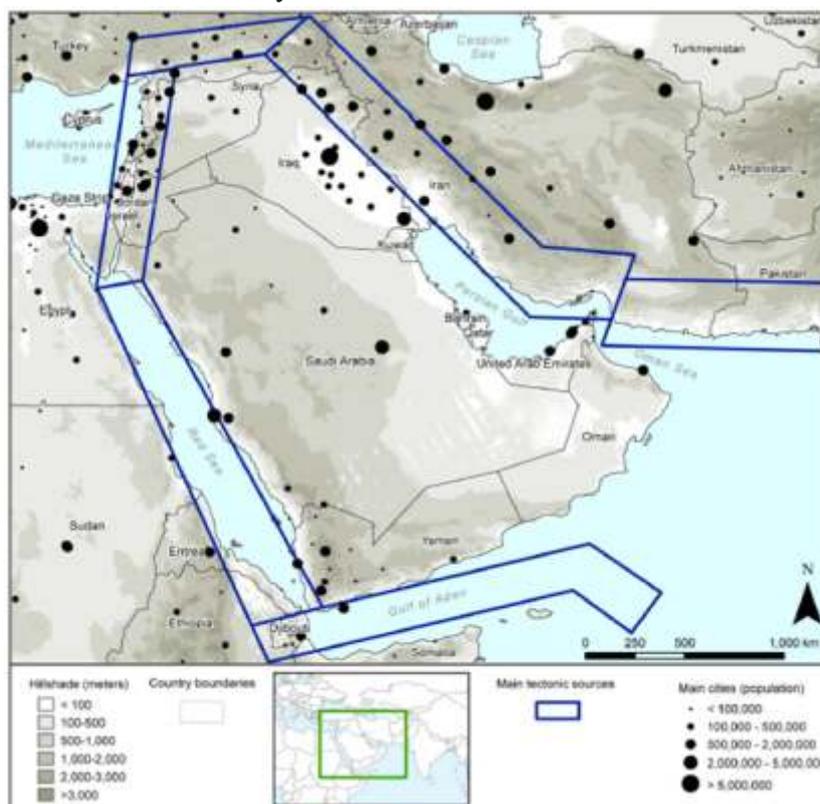
Shallow thrust faults[#] and strike-slip faults^{##} that occur at depth of less than 25 km drive seismic activity in region. However, in the southern part of Zagros and Makran subduction zone in south-eastern Iran is due to subduction process^{###}.

Most historic earthquakes of the region occurred in the following zones shown in Table 1.

Seismic Region	Main Types of Seismic Hazards	Countries Exposed	Earthquakes of Magnitude equal or greater to 5 for last 50 years	Chances of earthquake of magnitude greater than 8
The Zagros fold belt	Strong ground motion	Iran, Oman, UAE Kuwait, Iraq, Turkey, Syria	More than 400	No
The Makran Subduction Zone	Strong Ground Motion, Landslide, Liquefaction, Tsunami	Iran, Pakistan, Oman, UAE	Less than 5	Yes
Red Sea region and the Gulf of Aden	Strong Ground Motion	Yemen, Saudi Arabia Israel	More than 50	No
Dead Sea Fault Zone	Strong Ground Motion, Landslide, Liquefaction	Israel, Palestine, Jordan, Lebanon, Syria, Turkey	More than 20	Very small
Tectonic features of Eastern Turkey and North-western Iran	Strong Ground Motion	Turkey, Iran, Syria Lebanon	More than 50	Very small
Interplate and background seismicity	Strong Ground Motion	All countries in the Middle East	More than 20	No

Source: CATRisk Solutions

Lower seismicity in the Arabian Peninsula reflects that little internal plate deformation is currently taking place. However, but the region is surrounded by more seismically active belts. Figure 2 shows location of Major Cities in the Middle East and their position to main source of seismic activity.



Source: CATRisk Solutions



Damage in 2013 Bushehr earthquake | Source- Reuters

Past Damage & Risk Management

During past earthquakes, old construction suffered more damage. In rural areas, where hazardous adobe construction with brick or mud walls and heavy roof are common were damaged most. Among the newer buildings, which were constructed using building standards suffered less damage compared to those that lacked implementation of standards.

Countries like Iran, Republic of Yemen have incorporated standards and codes to construct earthquake resistant buildings. However, enforcement of those codes is still a challenge.

Table 2: Insured and economic loss due to recent earthquakes in region

Date of Occurrence	Location	Economic Losses (US\$)	Insured Losses(US\$)
August 18, 2014	Mormori, Ilam Province, Iran	43 Mln	N/A
April 9, 2013	Bushehr, Iran	297 Mln	N/A
October 23, 2011	Van, Erics, Turkey	1.5 Bln	90 Mln
May 19, 2011	Simav Kutahya, Turkey	244 Mln	4 Mln

Source: *Swiss Re*

Learning from experiences, the Middle Eastern countries are adapting prevalent practices in market such as use of analytics and catastrophe risk insurance which should enable them manage risk of natural catastrophe more effectively in future.

Thrust Fault are where ground on one side of the fault moves up and over adjacent ground.

Strike Slip Fault: A fault in which rock strata are displaced mainly in a horizontal direction, parallel to the line of the fault.

Subduction Process: Subduction is a geological where one plate moves under another and is forced or sinks due to gravity.

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