

# Earthquake in Afghanistan



Figure 1: Image courtesy, Cable News Network

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### Rizwan Mirza, CE

Editor-in-chief

On 7<sup>th</sup> October, 2023, at 07:40:29 (UTC), an earthquake struck 35 km NNW of Herāt, the third largest city of Afghanistan, located not far from the border with Iran.

It was a shallow earthquake with a depth of 7.7 km ( $\pm 3.8$ ). The energy released corresponded to 5.92 Mww.

The event played havoc with the buildings in the area and set panic waves into motion, as terror-stricken people were seen out in the streets with their belongings having disappeared.

The Taliban spokesman Zabihullah Mojahid put the number killed at 2,053 people, with more 1,240 people hurt and 1,320 houses completely or partially destroyed. There are fears the toll could rise further.

Rescue teams have arrived in the Herat province, and foods, water, medicines and clothes have also been sent to the site, Mojahid added.

The initial quake was also felt in neighboring provinces of Badghis and Farah and was followed by multiple aftershocks.

An earlier assessment from the UN had indicated a lower toll of around 100 dead and 500 injured. Close to 500 houses were reportedly destroyed and 135 buildings damaged, said the UN's Office for the Coordination of Humanitarian Affairs (OCHA).

"In total, 4,200 people (600 families) are assessed to have been affected to date," OCHA said.

Images showed massive heaps of debris and rubble after buildings collapsed. Crowds of survivors had gathered in the streets for safety.



Figure 2: Residents clearing debris; image courtesy, Cable News Network

"Mahal Wadakah is understood to be the worst affected village," the UN said, reporting at least 20 deaths. Other badly affected areas include Dasht Hows, Bahadorzai, Zoryan and Koshkak, it added.

"Additionally, an estimated 300 families (around 2,100 people) are reported to have been displaced to Herat City where they are living in abandoned buildings."

## Location Map

The following map shows the location of the event:

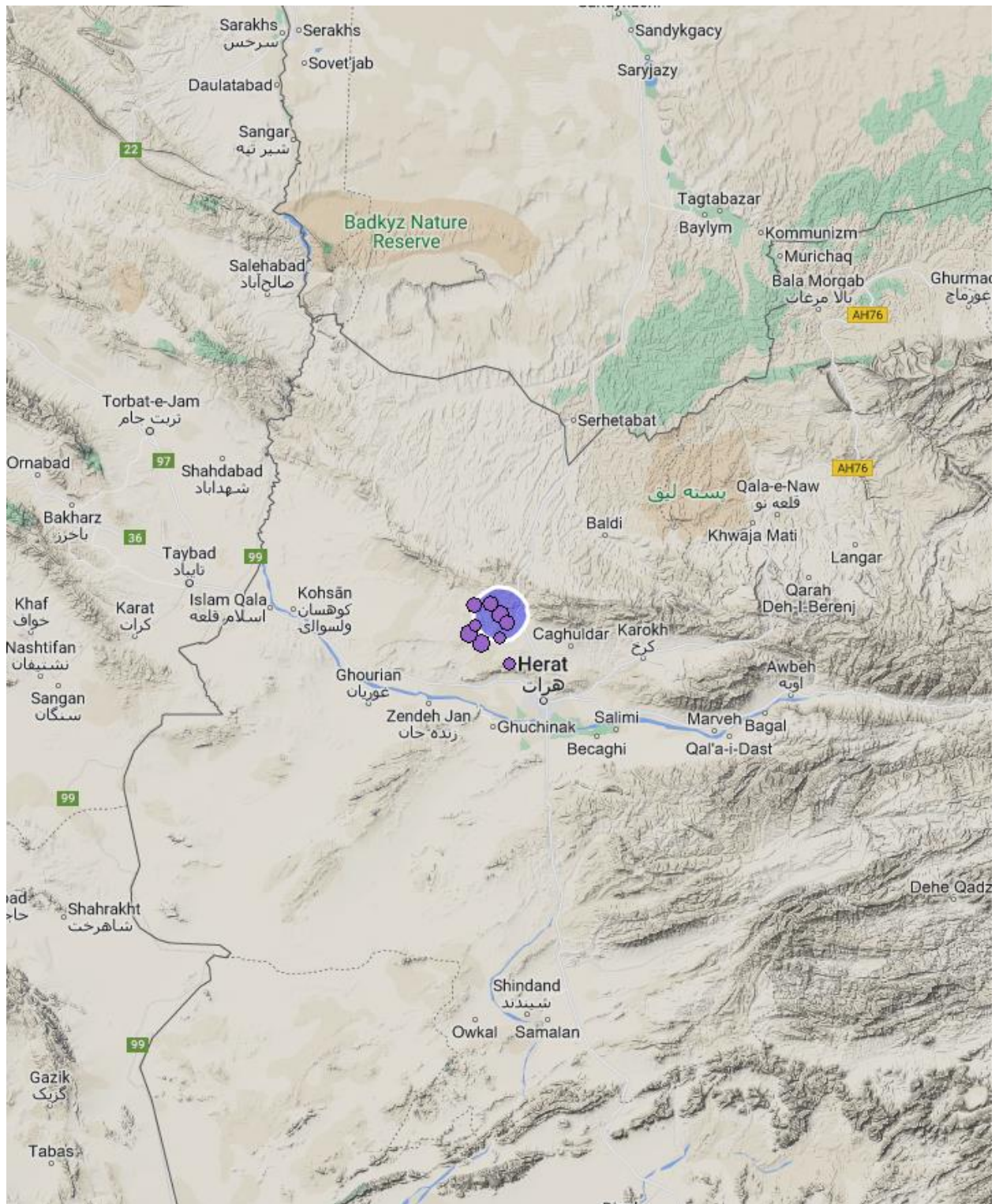


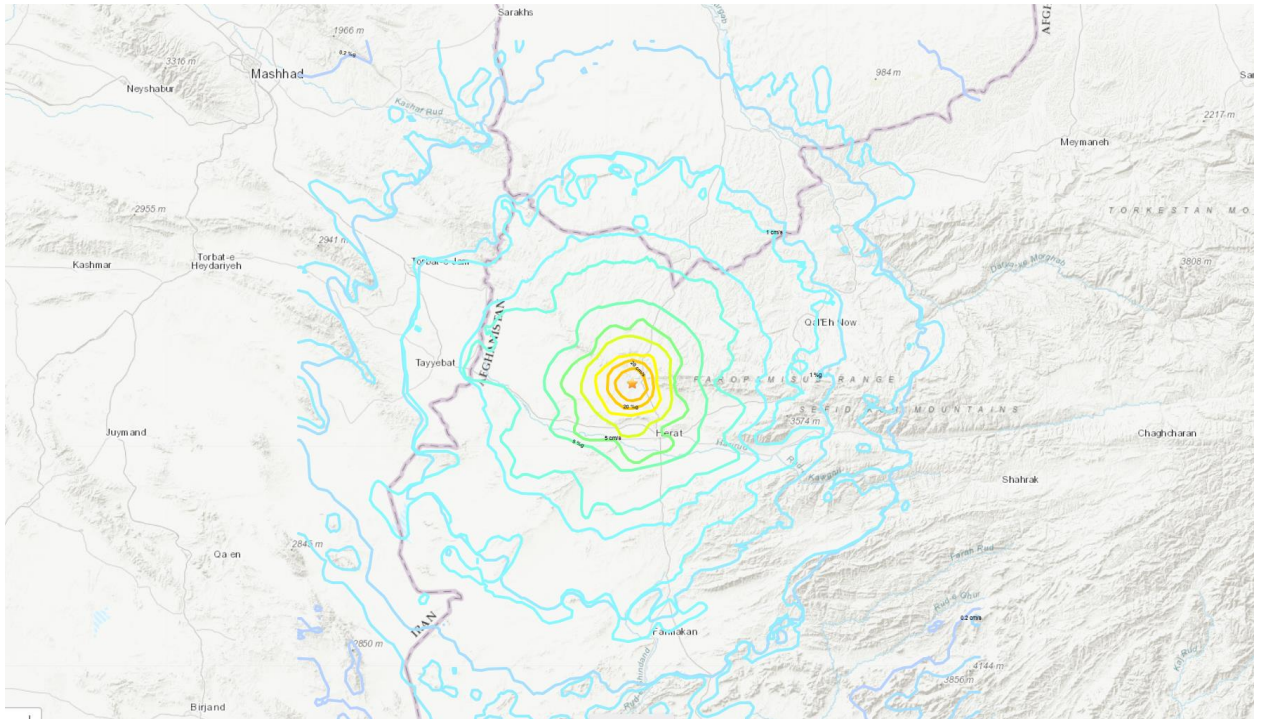
Figure 3: Map showing the location of the event

## Construction

Most of the houses in the area were adobe non-engineered structures. Possessing considerable mass and very little strength, these buildings stood practically negligible chances of survival and were erased to the ground.

## PGA Contours

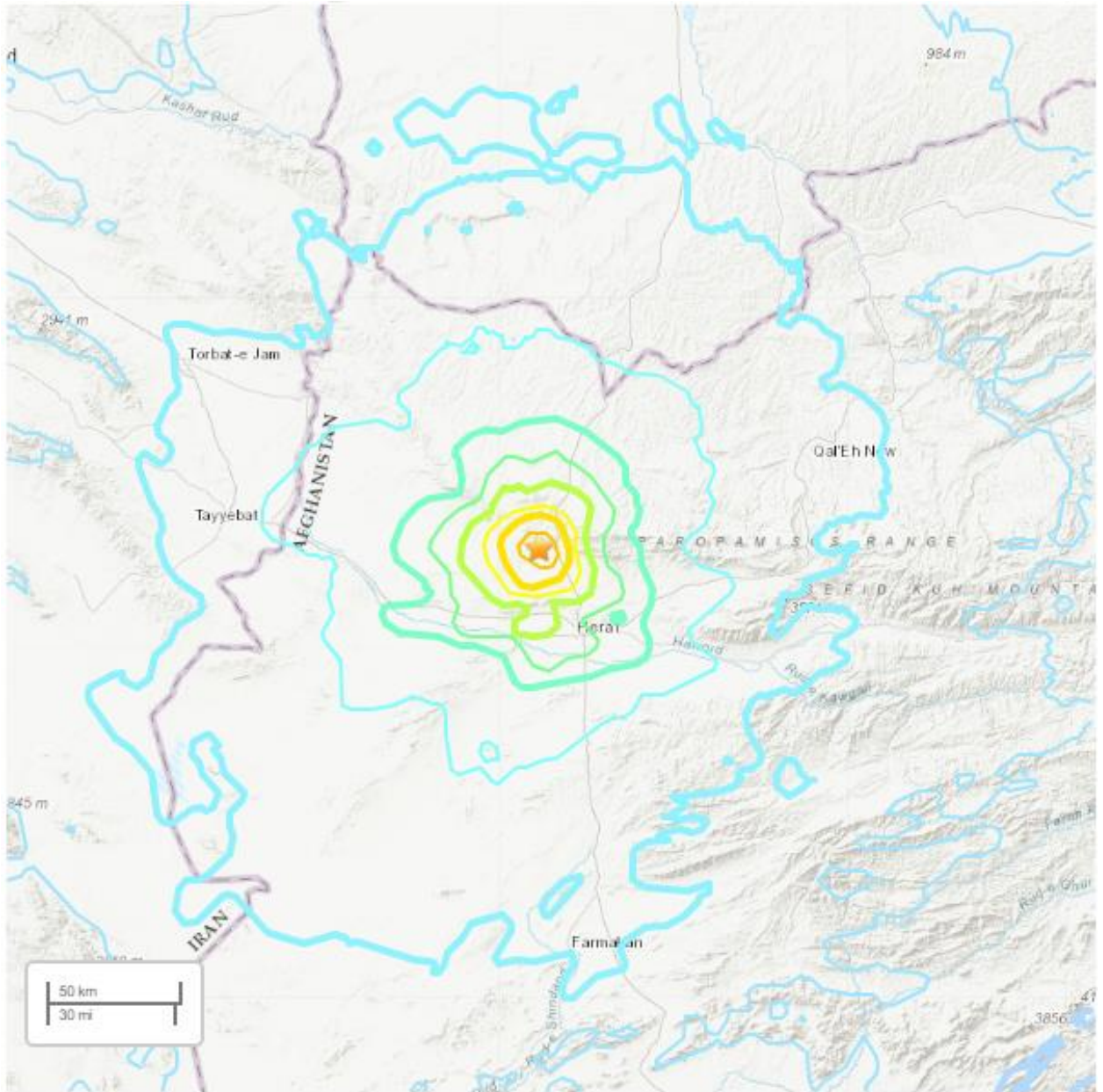
The following map shows PGA contours:



**Figure 4: PGA Contours**

## Estimated MM Intensity Contours

The following map shows the estimated MM intensity contours:



SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.0464	0.297	2.76	6.2	11.5	21.5	40.1	74.7	>139
PGV(cm/s)	<0.0215	0.135	1.41	4.65	9.64	20	41.4	85.8	>178
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

## Estimated Population Exposure

Following map shows the estimated population exposure:

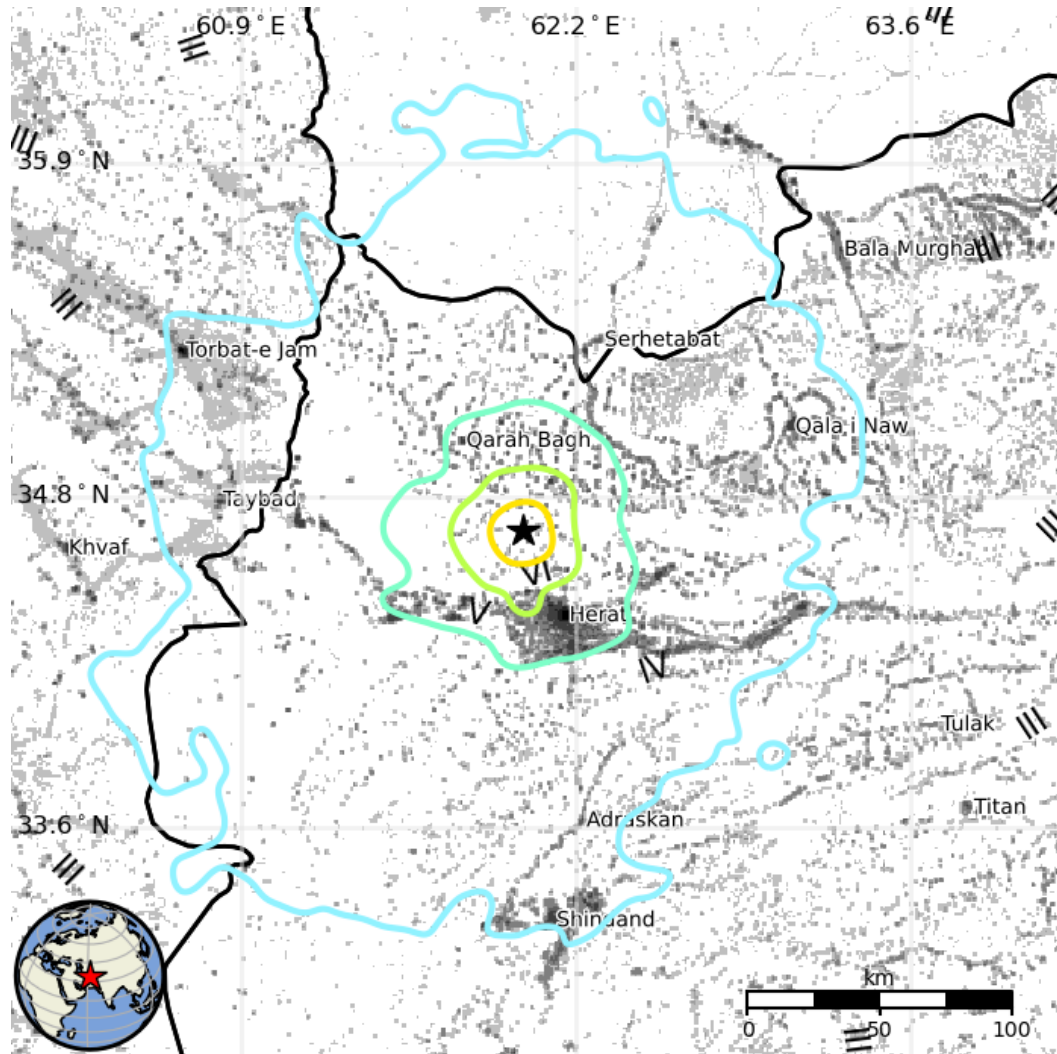


Figure 5: Estimate population exposure contours

Population per ~1 sq. km. from LandScan

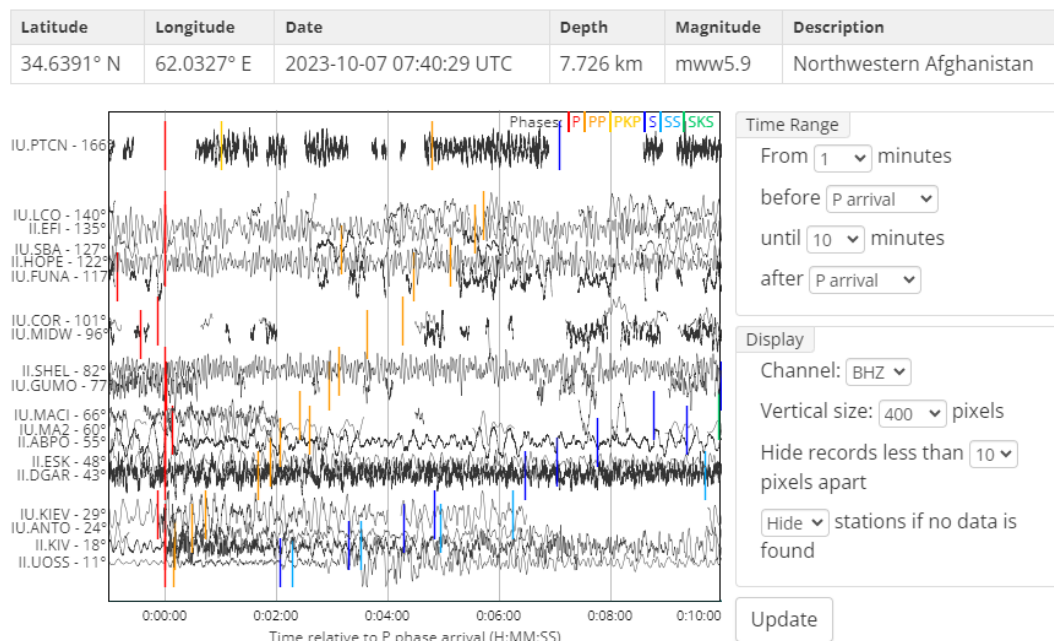
MMI	Shaking	Population
I	Not Felt	0 k*
II-III	Weak	1,400 k*
IV	Light	1,826 k
V	Moderate	1,271 k
VI	Strong	107 k
VII	Very Strong	10 k
VIII	Severe	0 k
IX	Violent	0 k
X	Extreme	0 k

\*Estimated exposure only includes population within map area (k = x1,000)

Figure 6: Estimate population exposure Key

## Waveforms

Following is an images of the waveforms recorded by various stations:



## Regional Seismology

The following map shows the regional seismology;

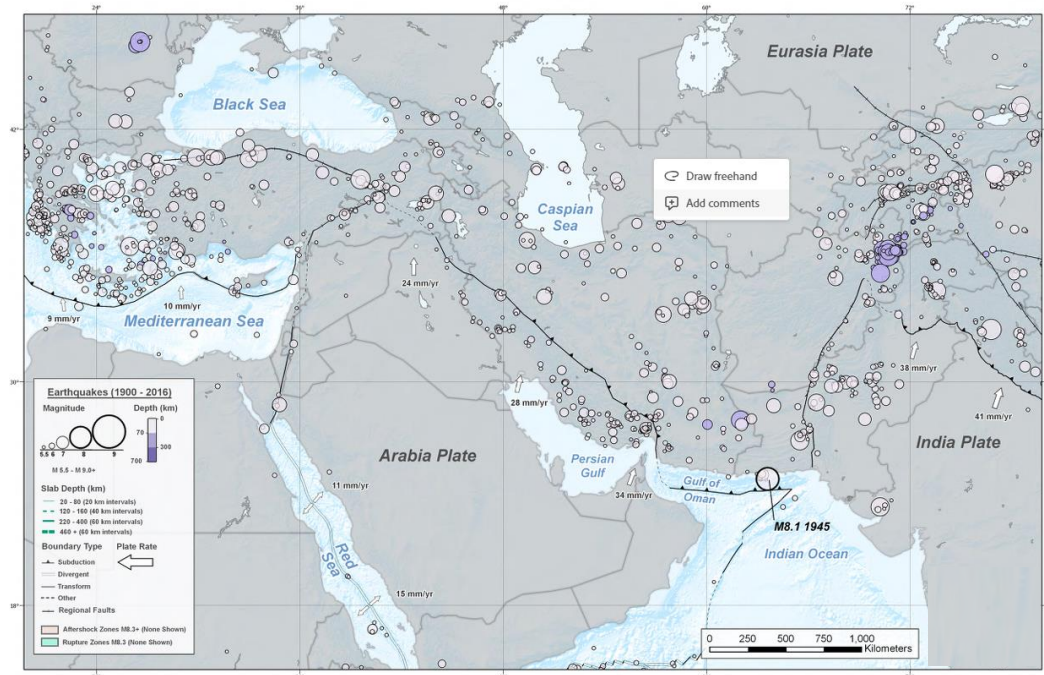


Figure 7: Map showing the regional seismology

## Epilogue

Afghanistan has suffered significant damage from a series of recent earthquakes amid an ongoing dire economic and hunger crises, killing and displacing tens of thousands combined.

*The country has long been one of Asia's poorest and has been ravaged by conflict for decades. But its ability to respond to natural disasters has been further hampered since the Taliban seized power in 2021 following the chaotic US withdrawal, an event that saw many international aid groups pull out.*

It also led to Washington and its allies freezing about \$7 billion of the country's foreign reserves and cutting off international funding. The situation has crippled an economy already heavily dependent on aid.

Last week the World Bank warned two thirds of Afghan families currently face "significant challenged in maintaining their livelihoods".

That makes is far harder for Afghans to recover from earthquakes, which are a regular phenomenon in a country that often experiences seismic activity.





# Upcoming Event



## **Pakistan Society of Civil Engineers**

Licensed, by the Pakistan Engineering Council, as a Professional Engineering Body

▶ Continuous Professional Development Initiative ◀

### **PSCE LECTURE No. 59**

Technical Lecture Counted Towards CPD Points Under  
Professional Development of Engineers Bye- Laws, 2008 of the PEC

## **Digitalisation of an engineering design, modular and off-site construction of a built environment project**



### **Engr. Khurram Tahir**

Chartered Engineer Mechanical and Building Services Engineering, Engineering Council (Australia)  
BSc (Hons) Mechanical Engineer, University of Engineering & Technology  
Green Star Accredited Professional, GSAP; Accredited Tier Designer (ATD) Uptime Institute  
Registered NER, Australia; RPB, Victoria

**Saturday, 14<sup>th</sup> October, 2023**

14.00 to 16:00, Pakistan Standard Time (PKT)  
9:00 to 11:00, Universal Time Coordinated (UCT)

On-line lecture to be joined through ZOOM.

Details would be sent, by email, to the registered applicants, a day before the lecture.  
For obtaining CPD points, live appearance of every participant is mandatory during the lecture.

### **Registration Fee:**

PSCE associates: Free  
Other engineers and allied professionals: PKR 500

### **Bank Details:**

Account title: Pakistan Society of Civil Engineers  
Account Number: 2008209912  
Bank: Silk Bank Limited  
Branch: Egerton Road Branch, Lahore 54000, Pakistan  
Branch Code: 0003  
IBAN: PK39 SAUD 0000 0320 0820 9912  
Swift Code: SAUDPKKAXXX

Contact person for registration:

**Mrs Sadia Naveed, Administrator**

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## PSCE Newsletter



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