SEISMOLOGICAL BULLETIN

OF

PAKISTAN

No. 202203

February, 2022

Issued under the authority of the Director General
PAKISTAN METEOROLOGICAL SERVICES
REGIONAL METEOROLOGICAL & GEOPHYSICAL CENTRE
QUETTA

PAKISTAN METEOROLOGICAL SERVICES

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The Seismological Bulletin of Pakistan is a monthly publication containing data of Seismological Network of Pakistan

PREFACE

Pakistan Meteorological Department (PMD) has been recording the intensity and magnitude of earthquakes since 1951, at seismic Observatory Quetta. In the beginning, the instruments namely Sprinterwere being used. Later on, the Sprenther instruments were replaced by WWSSN as part of global seismic network till 2006. After 2006, the digital seismic monitoring equipments known as GURALP system were installed across Pakistan including Quetta, Islamabad, Peshawar, Lahore, Zhob, Turbat, Gilgit. Since then, the GURALP Instruments are regularly being used to record the earthquake events across the country and the neighboring countries.

Earthquake activity in Pakistan is mainly concentrated in the north and western sections of the country, along the conjunctions of Indian plate with the Iranian and Afghan micro-plates. The Chaman Fault runs along Pakistan's western frontier with Afghanistan from Kalat, in the northern Makran range, past Quetta and then on to Kabul, Afghanistan. A fault also runs along the Makran coast and is believed to be of the same nature as the West Coast fault along the coast of Maharashtra, An active subduction zone exists off the Makran coast.

This zone forms the boundary between the Arabian and the Iranian micro-plate, where the former subducts or dives beneath the latter. Thrust zones run along the Kirthar, Sulaiman and Salt ranges. There are four faults in and around Karachi and other parts of deltaic Indus, and Makran coast. The first is the Allah Bund fault that passes through Shahbundar, Jah, Pakistan Steel Mills, and runs through eastern parts of the city and ends near Cape Monz record depicts that fault, in fact, has caused extensive damage in the past many centuries in the deltaic areas. The destruction of Bhanbhor in the 13th century and damage to Shahbundar in 1896 were caused by this fault. The other one emanates from the Rann of Kutchh. The third one is the Pubb fault which ends into Arabian sea near Makran coast and the last one is located in the lower Dadu district near Surajani and falls in the vicinity of Karachi. Tsunamis or tidal waves have also affected the coast of Pakistan. The worst case was in 1945 when an earthquake of magnitude 8 struck the Makran coast, generating Tsunami washing away the town of Gwadar, waves as high as 12 meters.

The 1935 Quetta earthquake occurred on 31 May between 2:33 am and 3:40 am at Quetta, Balochistan. The earthquake had a magnitude of 7.7 and more than 30,000, people died from the impact. This ranked as the deadliest earthquake that hit South Asia until the October 08, 2005 Kashmir earthquake that devastated most parts of Kashmir and adjoining areas with death toll of more than 70,000 and millions homeless.

Pakistan Meteorological Department
Regional Meteorological & Geophysical Centre, Quetta

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Particulars of Stations

Sr. No.	Station	Symbol	Latitude ° N	Longitude °E	Height (a. s. l.) in meters	Equipment Installed	Remarks
01.	QUETTA(Brewery)	Que	30.1887	66.9497	1721	Analog D.S.E.	Long period. Short period
02.	QUETTA (RSMC) (Sheikhmanda)	Que	30.2333	66.9833	1640	D.S.E.	Broadband
03.	KARACHI (TEWC)	Khi	24.9167	67.1333	38	D.S.E.	Broadband
04.	ISLAMABAD (NSMC)	Isb	33.6800	73.0600	543	D.S.E.	Short period
05.	KHUZDAR	Khz	27.7833	66.6012	1248	D.S.E.	Broadband
06.	ZHOB	Zhb	31.3375	69.4511	1421	D.S.E.	Broadband
07.	TURBAT	Tur	25.9833	63.0166	141	D.S.E.	Broadband
08.	PESHAWAR (RSMC)	Psh	34.0200	71.5600	392	D.S.E. D.S.E.	Broadband. Short period
09.	LAHORE	Lhr	31.5500	74.3300	210	Analog D.S.E	Short period Short period
10.	BALAKOT	Blk	34.5333	73.3333	995	D.S.E.	Broadband
11.	CHITRAL	Cht	35.8833	71.7833	1498	D.S.E.	Broadband
12.	UMERKOT	Umk	25.3333	69.7166	33	D.S.E.	Broadband
13.	MUZAFFARABAD	Muz	34.3646	73.4938	1169	D.S.E.	Broadband
14.	BAHAWALNAGAR	Bng	29.9500	73.2500	161	D.S.E.	Broadband

Abbreviations:

H	=	Origin Time.
ep, es & ex	=	emergence of primary-wave and emergence of shear wave and Unidentified wave
Mb	=	Body wave magnitude on Richter scale.
Mw	=	USGS magnitude on Richter scale.
H, M, S	=	Hours, Minute and Second in GMT.
Ipc	=	impulsive phase compression.
Ipd	=	impulsive phase dilatation.
N.S.M.C	=	National Seismic Monitoring Centre.
R.S.M.C	=	Regional Seismic Monitoring Centre.
D.S.E	=	Digital Seismic Equipment.

SUMMARY

The Seismic Monitoring Network of Pakistan Meteorological Department is working round the clock to record and monitor seismic activities all over the world, especially Pakistan, the South-Asia and neighboring countries.

In the month of February, 2022 total number of events recorded by PMD Seismic network were 32. The frequency analysis based on magnitude of events depicts that 08 events were Minor (03-3.9), 16 events were of mild magnitude (04-4.9). The network also recorded 06 events of moderate magnitude (05-5.9) and 02 events of severe magnitude (06-6.9) and zero(0) event of violent was reported by PMD Seismic network in the month of February, 2022 as depicted in the Figure 1.

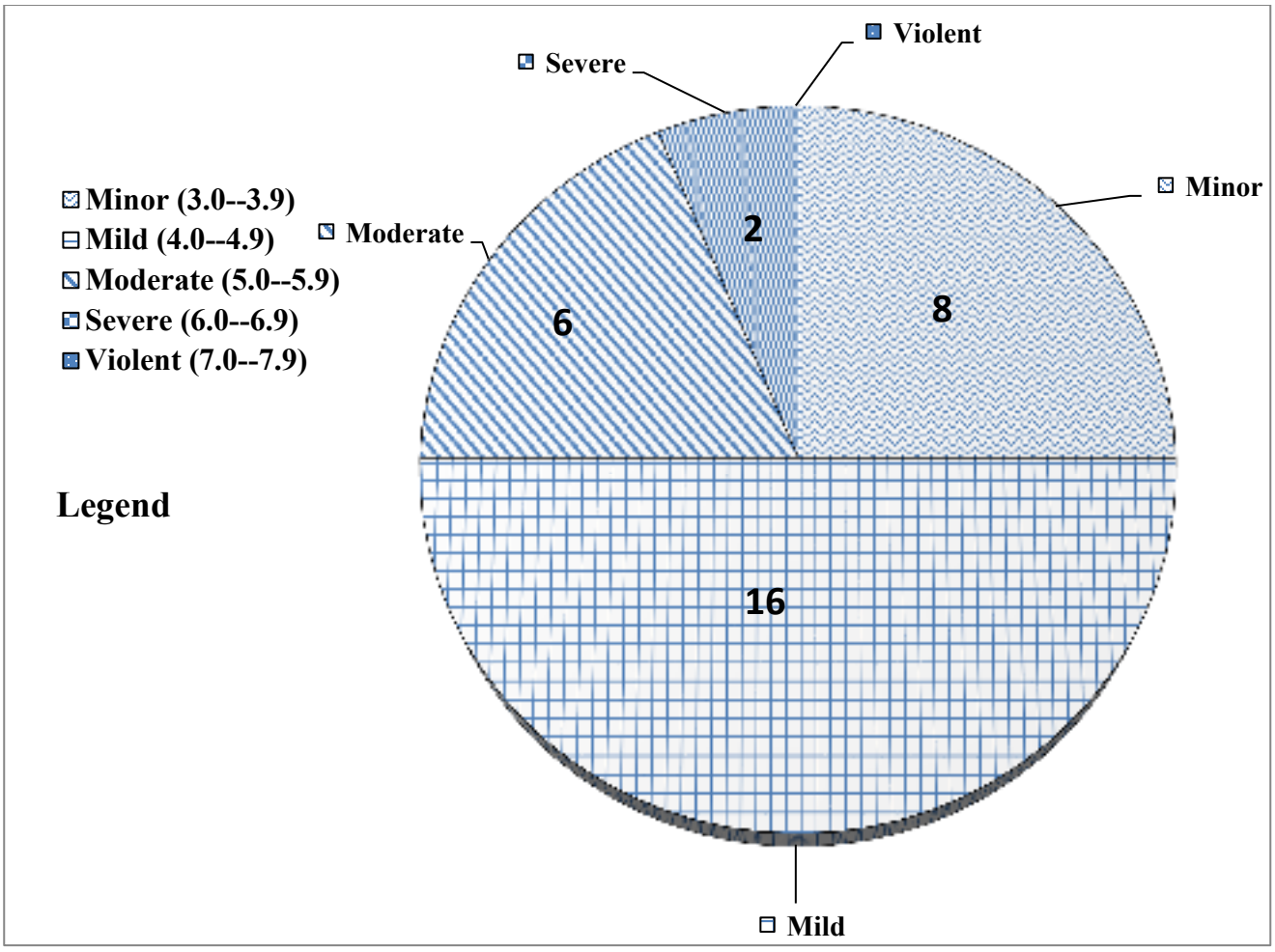

Figure 1: Frequency Analysis of the Magnitude of the Seismic Events Recorded by PMD Seismic Network. It shows the number of events recorded during the month of February, 2022 for different categories of severity.

FOCAL DEPTH

The frequency analysis based on focal depth of Seismic events for the month of February, 2022 was carried out. In the month of February, 2022 PMD Seismic network recorded totally 08 numbers of Major Seismic events.

The analysis depicts that the frequency of Shallow focal depth (0-70 km) seismic events was maximum with 05 numbers. Shallow focal depth earthquakes are also known as crustal earthquakes.

The Intermediate focal depth (70-300 km) seismic events was 03 number and no event of deep focal depth (>300 km) seismic events recorded by PMD Seismic network. Deep focal depth earthquakes are also known as Intra-Plate earthquakes.

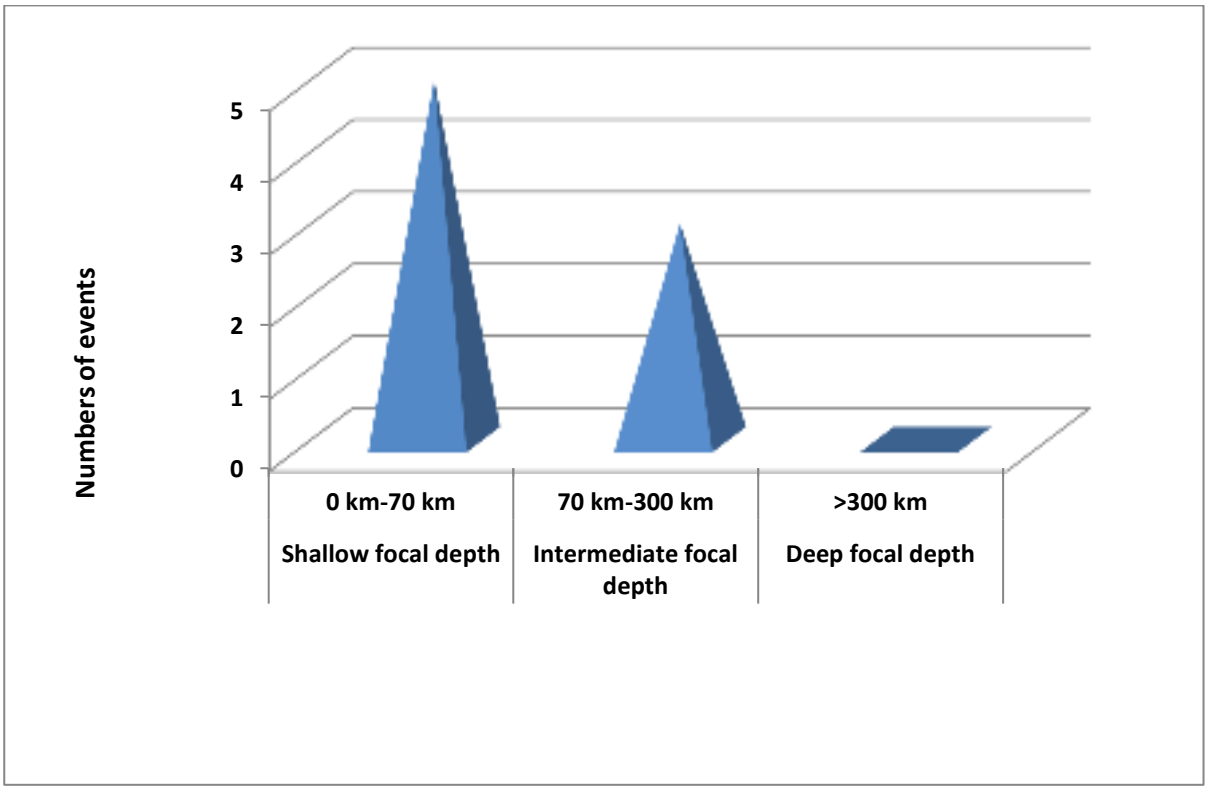

Figure2: Analysis of major earthquakes based on focal depth during the month of February, 2022.

February 2022								Major Shocks
Date	**Station**	**Phase**	**H:M:S**	**De**	**Magnitude**	**Lat**	**Long**	**Country**
1	Qta	ep es	- -	145	-	7.5 S	128.3 E	Banda Sea
	Isb	-	19:25:13		6			
	Pwr	ep es	19:35:56 19:44:38		6			
	Lhr	ep es	19:35:34 -		6			
	Usgs	-	19:25:02		6			
4	Qta	ep es	- -	54	-	7.3 S	105.8 E	Java, Indonesia
	Isb	-	10:10:43		5.3			
	Pwr	ep es	10:19:57 10:27:18		5.2			
	Lhr	ep es	10:19:29 -		5.3			
	Usgs	-	10:10:25		5.3			
5	Qta	ep es	- -	199	-	36.48 N	71.1 E	Afghanistan-Tajikistan Border Region
	Isb	-	4:16:09		5.9			
	Pwr	ep es	4:16:47 4:17:18		5.9			
	Lhr	ep es	4:17:22 -		5.9			
	Usgs	-	4:16:09		5.9			
13	Qta	ep es	- -	10	-	0.8 N	126.3 E	Northern Molucca Sea
	Isb	-	8:21:44		5.5			
	Pwr	ep es	8:31:57 8:40:14		5.5			
	Lhr	ep es	8:31:36 -		5.5			
	Usgs	-	8:19:50		5.5			
14	Qta	ep es	- -	10	-	70.75 N	14.9 W	Jan Mayen Island Region
	Isb	-	20:28:22		5.6			
	Pwr	ep es	20:34:58 20:38:10		5.7			
	Lhr	ep es	20:38:30 -		5.6			
	Usgs	-	20:28:10		5.6			

February 2022								Major Shocks
Date	**Station**	**Phase**	**H:M:S**	**De**	**Magnitude**	**Lat**	**Long**	**Country**
20	Qta	ep es	- -	10	-	18.47 S	71.39 W	Off Coast of Northern Chile
	Isb	-	11:58:19		5.3			
	Pwr	ep es	11:59:25 12:09:09		5.6			
	Lhr	ep es	12:17:11 -		5.3			
	Usgs	-	11:58:14		5.3			
25	Qta	ep es	- -	10	-	0.12 N	99.88 E	Northern Sumatra, Indonesia
	Isb	-	1:39:29		6			
	Pwr	ep es	1:47:28 1:53:46		6			
	Lhr	ep es	1:46:59 -		6			
	Usgs	-	1:39:05		6			
26	Qta	ep es	- -	140	-	5.58 N	126.4 E	Mindanao, Philippines
	Isb	-	6:15:55		5.3			
	Pwr	ep es	6:25:33 6:33:23		6			
	Lhr	ep es	6:25:11 -		5.3			
	Usgs	-	6:12:58		5.3			
	Qta	ep es	- -		-			
	Isb	-	-		-			
	Pwr	ep es	- -		-			
	Lhr	ep es	- -		-			
	Usgs	-	-		-			
	Qta	ep es	- -		-			
	Isb	-	-		-			
	Pwr	ep es	- -		-			
	Lhr	ep es	- -		-			
	Usgs	-	-		-			