

Iran Earthquakes: November/December 1990

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INTRODUCTION

While not yet recovered from the devastation caused by the major earthquake in June 1990 in Manjil, Northern Iran, that killed about 50,000 people, two other strong earthquakes during the months of November and December of 1990 shook the rural areas of Southern Iran. About 300 kilometers apart, these earthquakes were centered at the most active seismo-tectonic region of Iran, namely the Zagros Folded Belt. They were the biggest events to be recorded in the past two centuries in those regions. Both of them were associated with 100 year return periods. A brief summary of the earthquakes follows.

DARAB, NOV. 6, 1990 EARTHQUAKE

- * The main shock measured 6.6 on the Richter magnitude scale, and exceeded the 100-year event.
- * The epicenter was located in the village of Furg (27.80° N, 55.90° E), 1000 km SE of Tehran, near the town of Darab.
- * An aftershock of magnitude $M=5.6$, and several aftershocks of $M>3.5$ were recorded.
- * Aftershocks were felt at Bandar-Abbass (160 km to the south), and at Kerman (280 km to the NE).
- * Recent seismicity includes six events with $5.0 < M < 6.0$ during the years 1962 to 1974.



* A foreshock caused people to leave houses, limiting the number of casualties.

* Twenty-three people were killed and about 80 injured.

* More than 12,000 people were left homeless.

* Nine villages were damaged 70 to 100%, and more than ten villages 30 to 70%.

* Buildings were mostly made of adobe brick (sun-dried) and masonry, with wooden beam roofs.

* Damage to houses, schools, communications centers, and police stations were reported. Rockfalls blocked the roads in the mountainous regions.

* The overall damage estimate is about 2.5 million \$ U.S.

BUSHEHR, DEC. 17, 1990 EARTHQUAKE

* The main shock, $M=6.5$, is the largest recorded event in the region to date.

* The epicenter was located at Kalmeh-Poshtkuh, 750 km south of Tehran, 70 km east of the city of Bushehr (on the Persian Gulf).

* Previous major earthquakes included an event of $M=5.5$ in 1925, near the town of Ahram (15 km west of epicenter).

* Damage was concentrated mostly in the rural areas east of Bushehr.

* There was reported damage to residential and public buildings and hotels in the town of Borazjan (45 km NE of the

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Iran Earthquakes

epicenter). Highways connecting Borazjan to other major cities were also obstructed due to rockfalls and landslides.

* Buildings were of the same type as at Darab, namely adobe brick and masonry houses.

REFERENCES

Beberian M., "Contributions to the Seismotectonics of Iran - Part II." Geologic Survey of Iran, Report No. 39, 1976.

Neghabat F., Liu S.C., "Earthquake Regionalization of Iran," Proc. 6th WCEE, New Delhi, India, Jan. 1977, Vol. 2, pp. 531-536.

And items in the Ettelaat Daily, Kayhan Daily and Kayhan-e-Havai Weekly.

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Earthquake Insurance

The summary report is FEMA publication 201 and the summary and full technical report is FEMA publication 200.

Earthquake Reports

THE NEWCASTLE EARTHQUAKE 1989 - Background, causes, effects, implications; Russell Blong, George Walker, Gerhard Berz, Norman Griffiths, Paul Scott; June 1990. A publication of the Munich Re Service Division; 40 p. Inquiries to them at 143 Macquarie St., Box H35 Australia Square, Sydney NSW 2000, Australia. Ph. (02) 250-8000.

RECONNAISSANCE REPORT ON THE NORTHERN IRAN EARTHQUAKE OF JUNE 21, 1990, by M Mehrain, Dames & Moore, 911 Wilshire, Suite 700, Los Angeles, CA 90017. Technical Report NCEER-90-0017, October 1990, 46 p. NCEER, SUNY Buffalo, Red Jacket Quad, Buffalo, NY 14261.



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