

= 1970 Tonghai earthquake =

The 1970 Tonghai earthquake occurred on 4 January with a moment magnitude of 7.1 and a maximum Mercalli intensity of X (Extreme) . The strike-slip rupture originated on the Red River Fault , which had not experienced an earthquake above magnitude 7 since 1700 , and affected Tonghai County , Yunnan province , China . At least 10 000 people were killed , making it one of the deadliest in its decade . The tremor caused between US \$ 5 to \$ 25 million in damage , felt over an area of 8 781 km² (3 390 sq mi) . In Hanoi , North Vietnam , almost 483 km (300 mi) from the epicenter , victims left their homes as the rupture rumbled through the city .

Occurring during the height of the Cultural Revolution , it was not widely publicized by the Chinese government for well over a decade . The amount of aid and finances distributed was described by the Beijing Morning Post as " pathetically small " . Much of the aid provided to survivors was in " spiritual " form , including Mao Zedong badges and condolence letters . Nevertheless , the earthquake was among the first to be studied over a long term by the Chinese government . It was cited as one of the reasons behind creating the largest earthquake monitoring system in China , 25 years later .

= Background and tectonics =

Yunnan , the epicentral region , is one of the more seismically active Chinese provinces . The earliest earthquake recorded there was in the 9th century ; however , moderate to strong ones have been observed since the 15th century . Since the 9th century , 32 earthquakes with a magnitude of 7 or greater have occurred in the province . Shallow strike-slip faulting is a characteristic of Yunnan quakes .

Earthquakes in southwestern Yunnan , such as the 1970 Tonghai event , are less frequent than in other parts of the province . The Red River Fault , the fault line on which this quake is alleged to have occurred , has lacked seismological activity as a whole . Red River temblors generally rise at high angles , as shown in a 1962 Ministry of Geology report . Markings in sedimentary rocks indicate that several large earthquakes formed on the fault during the Pleistocene and Holocene epochs . Until this quake , no earthquake above magnitude 7.0 on the Richter scale had occurred on this fault since about 1700 , and the fault was believed to be " dead " . Since the 1970 Tonghai rupture , it is believed that the Red River fault is instead experiencing a long seismic gap similar to that of the Japan Median Tectonic Line , on which no major temblor has formed since 700 but produced massive ones during the Holocene epoch .

= Damage and casualties =

The epicenter of the quake was about 121 km (75 mi) southwest of Kunming and 97 km (60 mi) northwest of Gejiu ; this area was mainly a tobacco growing region . Effects of the rupture were felt over an area of 8 781 km² (3 390 sq mi) . In Hanoi , North Vietnam , almost 483 km (300 mi) from the epicenter , victims left their homes as the rupture rumbled through the city .

The earthquake measured 7.1 on the moment magnitude scale . It may have killed more than 15 000 people , making it the third deadliest in China during the 20th century , and injured an additional 26 783 . The tremor caused between US \$ 5 to \$ 25 million in damage . A Reuters news report , the only one in the immediate aftermath , mentioned the recording of a " severe " quake by Hong Kong 's Royal Observatory and cited an unconfirmed report that it might have destroyed part of Kunming . It caused 50 km (31 mi) of visible surface faulting on the Tonghai Fault . There was a maximum horizontal offset of 2.5 m (8 ft) and vertical offset of about 0.5 m (1.5 ft) . As a result of inversion techniques , scientists were able to decide that several events comprised the surface faulting . This further confirmed that the earthquake , along with a later earthquake in Yunnan in 1973 , corresponded to a fault within the area .

= = Aftermath = =

= = = Scientific study = = =

The earthquake was among the first to be studied over a long term by the Chinese government . More than 40 Chinese seismologists , engineers , and geologists visited the disaster zone to conduct research into the cause and damage of the earthquake ; some spending as much as a year collecting soil samples and recording other primary research evidence for future study . Such data was collected over a broad area of almost 1400 towns within the area .

= = = Reaction = = =

According to the Reuters report , the survivors came together to " fight against the disaster " . Much of the aid provided to survivors was in " spiritual " form . The Chinese government sent tens of thousands Quotations from Chairman Mao Zedong books and badges in his honor to victims as part of the relief effort , and survivors also received 14 @, @ 350 sympathy letters . However , the amount of aid and finances distributed was described by the Beijing Morning Post 30 years later as " pathetically small . "

The details of the earthquake were not widely publicized by Chinese authorities until about 18 years after its occurrence . In China 's first decades of Communist rule , its policy was to not disclose natural disasters or accidents unless foreigners were injured . While the Chinese official press had not released a comprehensive report , Reuters and the Royal Hong Kong Observatory both released information soon after the disaster . At the time of the quake , the Xinhua News Agency briefly mentioned a smaller magnitude quake but did not provide information on damage or casualties .

On 19 November 1988 , nearly nineteen years later , Chen Zhangli of the State Seismology Bureau , speaking at a news conference for another earthquake that had recently occurred , estimated the death toll of the 1970 quake to be 10 @, @ 000 . He did not give a reason why his government had not previously disclosed this knowledge . Government officials from China released a different estimate in 2000 , putting the death toll at 15 @, @ 621 . China published the estimate after a memorial service for survivors and relatives was held in Yuxi on January 5 . A Yuxi Seismology Bureau official noted that the information had been classified for " political reasons " and the death toll estimate had been known among bureaucrats as early as 1997 .

Twenty @-@ five years after the earthquake , the largest earthquake @-@ monitoring network nationally was established in Yunnan . It set up earthquake offices in every county to prepare for another large rupture . The 1970 Tonghai earthquake was cited as one of the reasons behind creating the monitoring system .