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Preservation and Utilization of Epicentral Earthquake Heritage in the San'in Kaigan Geopark

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The Kinki region is densely packed with active faults, and epicentral earthquakes have occurred many times. In the San'in Kaigan Geopark, several destructive earthquakes have occurred since the Meiji period (1868), including the 1925 North Tajima Earthquake (Kita-Tajima Earthquake, M 6.8), the 1927 North Tango Earthquake (Kita-Tango Earthquake, M 7.3) and the 1943 Tottori Earthquake (M 7.2). As such, our Geopark has many heritage sites related to epicentral earthquakes. We will introduce the damage of these earthquakes, disaster recovery, and discuss how we can preserve and utilize our epicentral earthquake heritage.

< Destructive Earthquakes in the San'in Kaigan Geopark >

The 1925 North Tajima Earthquake is also referred to as the Hokutan-Daishinsai, and the epicenter of seismic activity was in what is now the northern part of Toyooka city, Hyogo prefecture. The magnitude is estimated to have been 6.8 on the Richter scale. The towns of Kinosaki hot springs and Toyooka, both located near to the seismic center, were seriously damaged, and in total 428 died due to the earthquake itself and in the fire that occurred afterwards.

It has been reported that the epicenter of the 1927 North Tango Earthquake was in the northern part of the Tango peninsula, Kyoto prefecture and the magnitude was 7.3 on the Richter scale. The death toll is recorded to have been 2,925. The Gomura fault (NNW-SSE: left-lateral slip) and the Yamada fault (ENE-WSW: right-lateral slip) which are conjugate faults were moved simultaneously by this earthquake. The maximum dislocation of the Gomura fault was estimated to be 100 cm vertically and 270 cm horizontally. These faults are also known for the fact that the term "active faults" was used in reference to them for the first time in Japan.

The epicenter of the Tottori Earthquake was offshore from Ketaka District, now part of Tottori city, with a magnitude of 7.2 on the Richter Scale. In Tottori city, its seismic intensity was recorded as 6. 1,083 were killed, mainly in Tottori city. The Yoshioka fault that measures 4.5 km and the Shikano fault that measures 8 km long in the ENE-WSW trend were formed in this earthquake, and the Yoshioka fault exhibits a right-lateral slip amounting to 1.5 m in the maximum. In terms of vertical displacement, the south side was raised amounting to 75 cm in the maximum.

< Earthquake Recovery and Epicentral Earthquake Heritage >

At the Kinosaki hot springs, which were seriously damaged by the North Tajima Earthquake, the local residents have developed a recovery program. The fire wall itself is a Geosite now, and also the basalt of Genbudo Cave, which collapsed during the North Tajima Earthquake, is now used for the stone wall of the Otani River, making a beautiful scene. The European style buildings built after the earthquake are preserved as symbols of the earthquake disaster reconstruction heritage of Toyooka city and Kyotango city. The Gozoen building (a national cultural property) in Tottori city, which escaped destruction by the Tottori earthquake, is preserved and utilized as a local community center.

Three typical outcrops of the Gomura fault are preserved as natural monuments of Japan, and two of them are open to the public as Geosites. However, other faults are not fully preserved and utilized in this way.

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Many earthquake heritage sites remain in the San'in Kaigan Geopark, and it is possible to utilize them for disaster management education. However, we have not made much use of them until now. It is necessary to improve these sites and to utilize them for disaster management education.

Keywords: Earthquake Heritage, Preservation and Utilization, Geopark, San'in Kaigan, Earthquake Recovery