

Tateyama Kurobe Geopark for active fault disaster prevention/mitigation

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There are not a lot of residents and visitors who can be conscious of the systematic work of the Earth in the shadow of the natural benefit clearly. The eastern part of Toyama Prefecture caught in Tateyama mountain range of alpine height 3000m and Toyama Bay, Japan Sea, of water depth 1000m consists of a coherent geomorphology of seas and mountains, forming a certain cultural region where people live in the peculiar topography composed of the seaside alluvial fans. Favors and seafoods of the natural environment characterize the region, land nature rich in diversity increase, and by the nature of this locality named as mecca of sabo and environmental researches. The coherent topography accomplished by the 3000m high, steep cordillera and the 1000m deep bay and their geology composed of Hida Belt as a major tectonic province in Japan can demonstrate a global dynamism which showed by the trace of continental collisions, the intermittent igneous activity after the Mesozoic era, the crustal movements and the climate changes in the Paleozoic era in the whole region (called the Tateyama Kurobe region, hereafter).

The naturalist guide systems in Toyama Prefecture have been maintained for 30 years and continuously performed their activities on spread enlightenment and protection/preservation of the natural property and wealth. High activity by a lot of guide organizations, resident volunteer groups and individuals cover the whole region from the coastal plains along and Toyama Bay to the main ridge of Hida mountain range. The field museum about water circulation is a typical example of geo-tourism in the waterfront fan complex in this region.

Active faults such as Atotsugawa faults, Kurehayama faults, and Uozu-off Itoigawa fault zone are distributed in the region. The Atotsugawa fault is a famous strike-slip fault in Japan and was the target for the research program "active fault frontier". The Kurehayama fault is a reverse fault, which represents a typical example of inversion tectonics in the coastal plains and the strain concentration zone along the eastern margin of Japan Sea. This fault lies beneath the central urban area of Toyama City, and the construction department of the City conducted reflection surveys from 2010 years for 2 years, offering a good example of risk management by the local government. The Uozu-off Itoigawa faults are a typical example of active reverse fault, which would generate large tsunamis in the Toyama Bay. Since major types of active faults can be observed only in the geopark, this region can be utilized as a field museum for active faults and related disaster prevention. Cooperation reinforcement with the Itoigawa Geopark it neighbors inevitably is asked from existence of the Itoigawa offing fault which is submarine active fault.

A damaging earthquake occurred in the source area of Kurobe River on October 30th, 2011, after the off-Tohoku-district Pacific earthquake which occurred on March 11, 2011, and fumarole activity in the Jigokudani craters is also getting active in Tateyama Volcano, and the explosion crater Shinyu of Tateyama Caldera had also changed suddenly in a geyser from 2013. Moreover, the trench type great earthquake occurring in the Nankai-trough subduction zone is assumed at present. The central urban area of Toyama City in the Toyama plain should be utilized as 'field museum for disaster prevention and risk reduction' in this situation. This is because the Toyama plain was the severe disaster area by the 1858 Hietsu earthquake which was an induced earthquake of the Ansei Nankai-Tokai earthquakes and the urban area became as the case which has succeeded in rehabilitation by the feudal clan and unity of people.

Keywords: active fault, natural disaster, disaster prevention, disaster mitigation, field museum, SABO