Characteristics and development trend of secondary geological disasters caused by earthquakes

ChangXian Zhou¹, ShaoPeng Zheng², YouQuan Ye³, Hao Wang⁴, Ping Fu⁵
Xiamen Seismic Survey Research Center, Xiamen 361021, China
41500619@qq.com

Abstract: the secondary geological disasters caused by earthquakes are the most developed, the largest in scale and the most destructive. Based on the large earthquakes in the world in recent years, the secondary geological disasters caused by earthquakes and their damages are analyzed. At the same time, the development trend of geological hazards in the future is predicted.

1. Introduction
In recent years, large earthquakes occur frequently in the circum Pacific seismic belt and the Mediterranean Himalayan seismic belt. A large number of secondary geological disasters were induced. These secondary geological disasters cause a lot of loss of life and property, and it causes serious difficulties to rescue and reconstruction. A large number of earthquake examples show that strong earthquakes, especially, Strong earthquake occurred in mountainous area, secondary geological disasters such as landslides and collapses occurred generally; occurred in coastal and sea areas. Secondary geological disasters such as tsunamis are common in the ocean.

2. Secondary geological disaster and its damage measurement
The secondary geological disaster of earthquake refers to the geological disaster caused by seismic activity. Types of secondary geological disasters caused by earthquakes, here are many kinds of natural disasters, such as: direct disasters: natural disasters caused directly by surface vibration. Such as: ground cracking, dislocation; indirect disasters, such as slope damage (slope collapse, landslide); foundation effect (ground subsidence, sand liquefaction, plastic flow); tsunami, flood and other secondary disasters. The destructive effects mainly include: endangering people's lives and properties; destroying engineering facilities; causing resource loss and environmental damage, etc.

3. Characteristics of secondary geological disasters

3.1 earthquake genesis
The earthquake is the macroscopic manifestation of the change of the deep geological body of the earth's crust and the result of the movement of tectonic plates.

Block movement results in pressure and energy accumulation between adjacent plates. Generally, it will bend the huge rock, when the force exceeds the bearing capacity of the rock, it will cause the rock stratum to break, and then release it in the form of seismic wave.

There is an earthquake everywhere the seismic wave goes. The place where the earthquake occurs is the seismogenic fault, mainly including: ① deep fault; ②new faultEdge faults of fault basin: ③
secondary faults with strong internal difference of fault basin: ④ more than two faults.

Secondary active fault in the stress concentration area For example, the intersection and resurrection of two or more groups of active faults. The turning point of active deep fault. The end of active fault or the locked section with blocked displacement. Strong active section of active deep fault. And fault basin

Special parts related to activities, etc. For example, the M8.8 earthquake in Chile in 2010 is the result of plate movement, South America

The interface between the Nazca Plate and the South American plate on the west coast of the continent. The Nazca Plate meets the South American plate every year

The South American plate was compressed and accumulated energy by the subsidence below. Japan's M 9.0 Earthquake in 2011 is a reverse fault. The M-type earthquake is caused by the movement of the Pacific plate and the North American plate.

3.2 mechanism of secondary geological disasters

So many geological disasters are caused by earthquakes. The key to the occurrence of geological disasters is the strong earthquake Wave. The geological environment conditions, geomorphic conditions, active faults and broken rock mass in the earthquake area are geology

The formation of disasters laid the foundation.

Among the types of secondary geological disasters caused by earthquakes, the collapses and landslides are the most developed and widely distributed

Secondly, the ground collapse is widely distributed, but the number is not too much, and the occurrence of sand liquefaction is relatively common. Yan Yi

Based on the preliminary analysis of Wenchuan earthquake, it is concluded that most of the secondary geological disasters, such as collapse, have experienced rock

There are four processes of body explosion, ejection, scattering and accumulation. The cause of tsunami caused by earthquake: seabed

Stratum fracture, some stratum rise or fall violently, earthquake occurs, at this time, the earthquake causes "shaking" of sea water,

The whole water body fluctuates from the bottom of the sea to the surface of the sea. The fluctuation of the water body causes tsunami, and a large number of sea water flows into the inland.

3.3 conditions for secondary geological disasters

Compared with the general geological disasters, the fundamental difference lies in the excitation conditions or dynamic conditions

The difference. The dynamic condition of general geological disaster is rainstorm or man-made activity, while the secondary geological disaster is caus

The dynamic condition is earthquake.

The record of earthquake disaster shows that not all seismic activities will cause geological disaster, secondary geological disaster and

Magnitude is closely related to earthquake intensity. In general, the larger the magnitude is, the higher the seismic intensity is, and the secondary area is

The more serious the qualitative disaster is. According to the statistical analysis of Liu Fengmin and others, the magnitude is less than 5 and the intensity is less than VI

Degree, the secondary geological disasters seldom occur; magnitude 5-6, seismic intensity VI-VII, generally occur;

The magnitude of the earthquake is greater than 6, the intensity of the earthquake is greater than VII, and the activity of secondary geological disasters is strong [2].

4. Prediction of development trend of secondary geological disasters caused by earthquakes

4.1 stability and sustainability of secondary geological disasters
The stability of secondary geological disasters such as collapse, landslide and ground fissure induced by earthquake needs long-term monitoring and prediction. For example, the active period of debris flow will be maintained for 20-30 years, especially in the past 5 years, once encountered, debris flow will be very active. In the rainy season, debris flow activities will be particularly severe [3]. One of the causes of debris flow in Zhouqu, Gansu Province is "5.12". The mountains in Zhouqu are easy to collapse due to the earthquake, and it needs at least 3-5 for the mountains to recover to the pre earthquake level. Some are in basic stable state, some are in critical sub stable state, and some are in unstable state. For example, the earthquake in Japan caused the eruption of xinhuoyue volcano in southwest Japan, and whether the volcanic activity of Mount Fuji it will also become more active and need further observation. Indonesia earthquake has caused eruption of Merapi volcano for many times, which is active. The movement lasted two months. However, along the active faults, deep valley slopes, high and steep slopes of traffic trunk lines, along the slope. In the past three years, the geological disasters should be one of the high-risk areas may be the low-risk areas of geological disasters 10 years later [1]. It is necessary to strengthen the correct prediction (including alarm) of debris flow and landslide. Using the new theory of Modern Mathematical Science in forecasting. The landslide monitoring and prediction technology is represented by the application of unprecedented technology, "3S" and above comprehensive application; the alarm device of debris flow is gradually mature, which can send back information and make alarm successfully, avoiding personal injury Death.

4.2 diffusion caused by secondary geological disasters After the occurrence of secondary geological disasters, it may cause greater diffusivity, such as the level 9.0 geological disaster in Japan in 2011. The earthquake caused the explosion of the nuclear power plant, which led to the release of some radioactive elements, which will be released along with the current and the drift of atmospheric circulation has a certain impact on the surrounding countries and even the world. Therefore, earthquake induced geology. The occurrence of disasters and earthquakes requires regional and international joint prediction and prevention, and recovery and reconstruction after disasters. In order to minimize its harm.

5. Conclusion In a word, earthquakes are a natural phenomenon, and the number of geological disasters caused by mega earthquakes is large. Through the characteristics and mechanism of the earthquake geological disaster, we can correctly identify the geological disaster. The type has a certain guiding role in monitoring, forecasting and prevention. Exergy

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