Natural disasters and countermeasures in Ratnapura, Sri Lanka

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The purpose of this study is to investigate the basics of disaster countermeasure that can be used for disaster prevention education and that is flexible against nature and sustainable. We started to investigate them in the study area of Ratnapura district in southern Sri Lanka. Residents' awareness of the danger of natural disasters is still low there, so disaster prevention education has recently started in some areas. The education is conducted by the staff of the Ministry of Health, Government of Sri Lanka. In September 2019, we carried out a field survey on the natural disasters and the countermeasures for flood and landslide. In the survey, we received the support by them. Geologic map data of the US Department of Interior, Global Map data, ASTER GDEM, SRTM1and Landsat data were used as basic geographic data. From these geographic information, we were able to roughly understand the distribution of roads, water systems, land covers, altitudes, slopes, drainage basins, and geology.

The geology is Precambrian metamorphosed sedimentary rock, which is gneiss. Mountains, hills and lowlands can be seen there. The altitude is several tens of meters in the lowlands and around 500 m in the mountain areas. The mountains are widely covered with forests and have steep slopes, but there are also gentle slopes in some places. The landform with gentle slope is widely used as a tea plantation, and public facilities such as hospitals are often located in landform with such conditions. We were able to observe a lot of cracks in the foundation of a hospital building that indicated landslide is occurring. The landslides occurred on steep slopes in the mountain areas. This makes it difficult for roads in mountainous areas to pass. Most of the landslides which we investigated were slide-type slope failures caused by highly weathered basement rocks. The lowland is subdivided into alluvial plain and upland. Residential areas and agricultural lands are widely distributed in the alluvial plain. We confirmed that flood damage is likely to occur in lower elevation areas of the plain. There, the pedestals of the Buddha statue are unusually raised to escape flooding. High-class residential areas and public facilities such as hospitals are often located on the uplands. The hills are widely covered with forests. In urban areas, residential areas also develop at the foot of the hills with gentle slopes.

From the field survey, we understood some flexible responses of local people to natural disasters in their society. We confirmed countermeasures to use gentle slopes against landslide, and to use higher landforms or to raise the foundation against flood. However, the basic geographic data used was not able to represent the landform conditions in which the likelihood of landslide and flood could be estimated. In the next stage, we would like to examine in detail the safety landform condition and its land use from the analysis of large scale topographic maps and high resolution satellite data based on field surveys.

Keywords: landslide, flood, Sri Lanka, disaster prevention education

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