Topographic evolution after the Aso-4 pyrocrastic flow and the meaning for disaster prevention in the Oita Bungoono Geopark, Japan

*Toshikazu Yoshioka[1]

1. Oita Bungoono Geopark Promotion Council

The southwestern part of Oita Prefecture, where the Oita Bungoono Geopark is located east of the Aso volcano, and the plateau formed by the Aso-4 pyroclastic flow that erupted about 90,000 years ago is spreading. The plateau was dissected by the Ono River and other rivers, and the remaining part of the plateau is called "Haru" and is used as a vast agricultural land. Of the dissected valleys, the valley bottom of the basin formed by relatively small rivers has been used as a residential area because it is easy to obtain water for living. On the other hand, the Ono River, which is one of the longest rivers in Kyushu, forms a deep valley while meandering, and although several river terraces can be seen along the river, the alluvial plain is hardly distributed.
The central city area of Mie Town, where the Bungo Ono City Hall is located, is located near the confluence of the Mie River and Tamada River, which are tributaries of the Ono River. After merging with the Tamada River, the Mie River does not head toward the main stream, the Ono River, but flows southeast toward the mountains, and after merging with the Matsuo River, flows north and joins the Ono River. The area near the confluence with the Matsuo River is a constriction, and upstream of it is accompanied by a wide alluvial lowland, but after the confluence it forms a deep valley.
These topographic features are greatly related to the characteristics of disasters in this area. First of all, along the Ono River, there is a disaster caused by the rise in water level during rainfall. The Ono River has a large basin area, and the upstream area includes areas with high rainfall such as the Aso, Kuju, and Sobo-Katamuki mountains. In addition, dencely welded tuff of the Aso-4 pyroclastic flow is distributed along the main stream, and the valley bottom plain is narrow because lateral erosion is hindered, and the water level rises at once when the water level rises. On the other hand, the lowlands along the tributary Mie River have their exits blocked, so once flooding occurs and the surrounding lowlands are flooded, drainage may become difficult. In addition, the small tributaries that flow into the Mie River are relatively steep and the valley width is narrow, so it can be pointed out that a disaster may occur due to debris flow. Furthermore, on the slope of the plateau edge, the base may be eroded by the gushing of groundwater, and the upper part of the slope may easily collapse.
The content of this presentation was given at the Association of Disaster Prevention Expert of Miemachi in October 2020, and efforts are being made to help with disaster prevention activities in the region.

Keywords: Oita Bungoono Geopark, Aso-4 pyroclastic flow, Ono River, topographic evolution, disaster prevention

