

Characteristics of gradient of valley plain in Ibaraki Prefecture

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In the liquefaction risk assessment using landform classification, Nakano et al. (2015) divided the valley plain/flood plain into two parts with a gradient of 1/100, but the reason is not described clearly. The gradient of all valley plain/flood plain in the Land Condition Map in Ibaraki Prefecture was measured using the section function of "GSI Maps". In addition, we sampled a valley plain with hand auger and investigated the relationship between gradient and particle size of structure materials.

As a result, the valley plain/flood plain steeper than gradient 1/100 accounted for only less than 10 percent by the extended, and its location was limited to a valley head. The gradient of the valley plain dissecting the plateau is steeper than roughly 1/500. Liquefaction caused by the 2011 off the Pacific coast of Tohoku Earthquake didn't occur at the valley plain steeper than gradient 1/500.

On the other hand, most of the flood plain along great rivers in Ibaraki Prefecture have a gentler gradient than the gradient of approximately 1/500, and no particular correlation was found between the liquefaction occurrence spots and the gradient.

For the liquefaction risk assessment based on the landform classification, the valley plain/flood plain needs to be divided into the flood plain along the great rivers and the valley plain dissecting the plateau, and the valley plain has a gradient more than 1/500.

In addition, as a result of sampling using a hand auger and particle size analysis in the valley bottom plain dissecting the plateau, coarse sand was dominant at a deeper than 3 m in the upstream core with a gradient more than 1/100. The result of analysis is supporting the supposition that a rough grain-size deposits are accumulated at steeper valley plains.

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