

Development of Geoinformatic Database Integrating River-banks with Subsurface and Its Application to Seepage Induced Disasters (English Presentation)

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Research Background

A river-bank exists to secure inhabitants against floods. It is well-known that a river-bank collapses when river water overflows in a flood but the torrential rain induced rising water washed away the river-bank of Yabe River in 2012 without overflowing the river-bank. The destruction is considered to depend upon seepage of the river water in the ground. The geo-information of river-banks together with natural surface strata is necessary to evaluate the fragility of river-bank structures particularly for the assessment of seepage induced collapse. The existence and lateral continuity of a high permeable layer through cross-sections of river-banks is one of the most important geotechnical information. The Kansai Geoinformatic Database has developed with more than 80,000 borehole data in Kansai Area and utilized for various geotechnical problems. The domestic database for river-banks of Yodo River has been developed independently in the Ministry of Land, Infrastructure, Transport and Tourism Kinki Regional Development Bureau and we have not able to gain a direct access to this river-bank data. Considering the recent situation of repeating localized torrential rain and its induced increase in risk of flooding, the collaborative project in terms of the integration of the Kansai Geoinformatic Database and the river-bank data to achieve a better disaster assessment and prevention of river-banks.

Purpose of the study

In the first year of the project, the existing database is updated by integrating the data of the bank of Kizu River, Kyoto. The object area is focused on the riversides from the confluence point of Katsura River, Uji River and Kizu River to the upstream part of Kizu river as shown in Fig. 1.



Fig. 1 Distribution of subsoil borehole data of KG-NET and river-bank data of MLIT

As a research subject, we develop the integrated models of natural sedimentary subsoils for backside wetlands and floodplains along Kizu River and artificial river-banks by using the updated database. Then, the developed model is expected to be utilized for the assessment of stability of river-bank structures such as the rise in water induced seepage failure.