

On flood simulation of lower reach of the Yura-gawa River by finite volume method

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ABSTRACT

In recent years, there were so many floods in many first-class rivers in Japan. A lot of people in the Yura-gawa River, a first-class river, have suffered from flooding caused by Typhoon No.16 in 2004 and Typhoon No.18 in 2013. The Yura-gawa River has 1,880 km² drainage area and is a medium-sized river of 146 kilometers in length. At present time, a ring levee surrounding a village and its levee raising have been conducted as a countermeasure of river flooding in the Yura-gawa River by the Ministry of Land, Infrastructure and Transport in Japan. On the other hand, the inundation inside a ring levee has frequently occurred by a sluice gate constructed between the levee and the Yura-gawa River. The sluice gate has no drainage pump because of economic problem. River flooding analysis needs a topographical map, which is made from three-dimensional map information database in the Geographical Survey Institute in Japan. In this paper, the effect of ring levee on the river flooding in the Yura-gawa River is numerically investigated on a topographical map by the finite volume method.

The summary obtained in this paper is as follows.

- (1) River flooding simulation on a topographical map made from three-dimensional map information database including a lot of existing geographical conditions can conduct by the finite volume method.
- (2) River flooding in the lower reach of the Yura-gawa River caused by Typhoon No.16 in 2004 when ring levee has not constructed can be accurately simulated by the finite volume method.
- (3) Ring levee surrounding a village has a significant effect against river flooding in the lower reach of the Yura-gawa River under the condition of Typhoon No.16 in 2004. Consequently, heavy river flooding in the lower reach of the Yura-gawa River may be dependent of the height of ring levee.

REFERENCE

Fukuchiyama Office of River and National Highway, Kinki Regional Development Bureau, The Ministry of Land, Infrastructure and Transport in Japan : Basic Policy Formulation on Rive Improvement Plan in the Yura-gawa Rive system, 1999.

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