

Promotion of disaster reduction measures by sharing the flood-prone area map for small and medium-sized rivers in hilly and mountainous areas (Study period: FY2017)

ITAGAKI Osamu, Head TAKEUCHI Yoshinori, Senior Researcher
MIYOSHI Tomohiro, Researcher NISHI Hiroki, Researcher
River Department, Flood Disaster Prevention Division

Keywords: small and medium-sized rivers in hilly and mountainous areas, flood risk map, disaster reduction measures

1. Issues on flood risk information of small and medium-sized rivers in hilly and mountainous areas

The July 2017 Northern Kyushu Heavy Rain caused serious sediment and flood disasters in the Akatani River in the Chikugo River system and other rivers flowing through hilly and mountainous areas. Such river (and sediment) overflow in small and medium-sized rivers of hilly and mountainous areas often occurred in other areas, including the 2016 flood in the Omoto River of Omoto River system in Iwate Prefecture, and could occur at any time and place in light of the present level of development in small and medium-sized rivers in the country.

However, it is difficult to say that flood risk information has been shared in society; e.g., flood-prone areas are not specified in most of the small and medium-sized rivers in the country. Therefore, Flood Disaster Prevention Division has been studying methods for social sharing of flood risk information on small and medium-sized rivers in hilly and mountainous areas.

2. Development of flood-prone area map (tentative name)

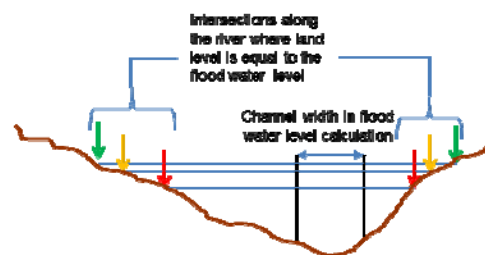
Heavy rain in a scale exceeding the river flow capacity will increase the possibility of flood, inundation, scouring/erosion, sediment deposition, etc. Since heavy rain in such a scale could occur at any time, it is considered significant for reduction of flood damage to share in society flood risk information in advance for each site near rivers and to use land based on the risk.

However, since total length of small and medium-sized rivers of hilly and mountainous areas is enormous, data required for risk analysis, such as channel shapes, is often insufficient and it is considered unreasonable in terms of cost, etc. to conduct risk analysis on such enormous length using flood simulation etc.

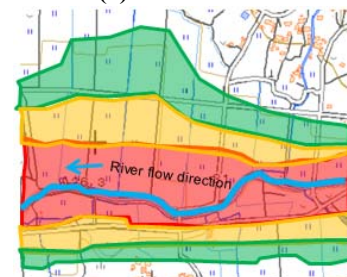
For this reason, we developed a flood-prone area map (tentative name) as a method for simply sharing the minimum flood risk information for small and medium-sized rivers in hilly and mountainous areas. In developing the map, we used the evaluation system for the safety level of flood control in small and medium-sized rivers¹⁾ for labor saving, which was developed in fiscal 2005, and adopted a method

simpler than the simple method provided in the "Guide to preparation of flood-prone area map for small and medium-sized rivers" (Mar. 2016, by Flood Risk Reduction Policy Planning Office, Water and Disaster Management Bureau, MLIT).

Figure shows the concept of flood-prone area map (tentative name). This map represents the points (lines) of intersection between the ground surface and the river water levels that were obtained by rough calculation (assuming a vertical wall on each river bank) for each excess flood flow in multiple cases (3 cases in the map) and extended over the land along the river, and this was applied to some model rivers on a trial basis.



(a) Cross section



(b) Plan view (background map from the Geospatial Information Authority of Japan)

Figure: Concept of flood-prone area map (tentative name)

3. Future schedule

Based on the results of trial application, we are going to study the method of using the map in considering city planning, etc.

☞ See the following for details.

1) Outline of the evaluation system for the safety level of flood control in small and medium-sized rivers

<http://www.nilim.go.jp/lab/rcg/newhp/seika.files/lp/index.html>