

A Study on Characteristics of Runoff Analysis Methods at the Time of Rainfall in Rural Area, Okinawa Prefecture Part 2: A Case of Kohatu River in South Central Part of Okinawa Pref

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Abstract : The rainfall in Japan is gradually increasing every year according to Japan Meteorological Agency and Intergovernmental Panel on Climate Change Fifth Assessment Report. It means that the rainfall difference between rainy season and non-rainfall is increasing. In addition, the increasing trend of strong rain for a short time clearly appears. In recent years, natural disasters have caused enormous human injuries in various parts of Japan. Regarding water disaster, local heavy rain and floods of large rivers occur frequently, and it was decided on a policy to promote hard and soft sides as emergency disaster prevention measures with water disaster prevention awareness social reconstruction vision. Okinawa prefecture in subtropical region has torrential rain and water disaster several times a year such as river flood, in which is caused in specific rivers from all 97 rivers. Also, the shortage of capacity and narrow width are characteristic of river in Okinawa and easily cause river flood in heavy rain. This study focuses on Kohatu River that is one of the specific rivers. In fact, the water level greatly rises over the river levee almost once a year but non-damage of buildings around. On the other hand in some case, the water level reaches to ground floor height of house and has happened nine times until today. The purpose of this research is to figure out relationship between precipitation, surface outflow and total treatment water quantity of Kohatu River. For the purpose, we perform hydrological analysis although is complicated and needs specific details or data so that, the method is mainly using Geographic Information System software and outflow analysis system. At first, we extract watershed and then divided to 23 catchment areas to understand how much surface outflow flows to runoff point in each 10 minutes. On second, we create Unit Hydrograph indicating the area of surface outflow with flow area and time. This index shows the maximum amount of surface outflow at 2400 to 3000 seconds. Lastly, we compare an estimated value from Unit Hydrograph to a measured value. However, we found that measure value is usually lower than measured value because of evaporation and transpiration. In this study, hydrograph analysis was performed using GIS software and outflow analysis system. Based on these, we could clarify the flood time and amount of surface outflow.

Keywords : disaster prevention, water disaster, river flood, GIS software

Conference Title : ICGDMRM 2019 : International Conference on Geomatics, Disasters Management and Rescue Maps

Conference Location : Singapore, Singapore

Conference Dates : March 28-29, 2019