AOGS 2005

Flood Disaster Management through Adjusting the Approaching Angles at Junctions in the Natural Stream

G. W. CHOI[1], Y.S. PARK[2] and S.J. AHN[3]

[1]*Professor, Dept of Civil and Environmental Engineering, University of Incheon*
[2]*Director, Division of Water Resources, Hwa Shin Engineering, Seoul, Korea*
[3]*Professor, Dept of Civil Engineering, Chung Buk National University, Cheong Ju, Korea*

The natural stream consists of complex network with several tributaries linked with junctions. The phenomena at stream junction can be described as the complex system compared to the single stream for the stage, velocity and so on. In the stream junction, the hydraulic characteristics are sensitively varied depending upon the variation of the discharge and/or approaching angle.

In this paper, the flood disaster management is presented through adjusting the approaching angles at channel junctions in the different discharge ratios between the main stream and the tributary. The velocity, stage, stagnation zone and deposition area near stream junctions are examined to indicate the disaster reduction near the junctions. The maximum velocity is increased by increasing the approaching angle and the discharge ratio between the main stream and the tributary. The length from the stream junction to the point of maximum velocity is increasing by increasing the approaching angle and the discharge ratio between the main stream and the tributary. The length of stagnation zone is increased by increasing of approaching angle and the discharge ratio between the main stream and the tributary.

Accelerating zone of the velocity is occurred in the middle of the stream consists of small approaching angles. However, the influence zone is increased by increasing the approaching angles.

The water stage is increased by increasing the approaching angles at stream junctions and then is decreased after passing the peak stage. The peak stage at junctions in the stream having the same discharge ratios between the main stream and the tributary is changed based upon the variation of flood events.

The results indicated in this paper can be utilized for a flood protection method in the natural stream through changing the approaching angles at stream junctions.

Keywords: Flood Management; Stream junctions; Approaching angles

References

[1] J. R. Philip J. WRR.: Fluid Mech. Fra. Junc. **24,** 239(1988).