DEVELOPMENT OF FLOW ESTIMATION TECHNIQUE AND SYSTEM IN RIVER

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The discharge in a natural river can be determined by direct or indirect measurement. In general, the flow velocity is measured by using float during the flood season and current meters or partial-flumes during the normal or dry season. However, these methods can cause significant errors according to the expertness of engineer and the condition of observation point makes a difficulty to measure continuously. In this study, we developed a model to estimate efficiently the discharge with the coefficient of roughness which can be considered major hydraulic characteristic in a natural river. We can obtain continuous discharge data through the basic hydraulic information including water level, river bed, water slope and pertinent coefficient of roughness without field measurements for flow velocity. Discharge measurements in field have been carried out at Gonju gage station located in the down stream of the Daechung Dam during normal and dry seasons from 2003 to 2004. The model developed in this study is compared with results from existing rating curve at T/M gage stations and can be used to runoff analyses.

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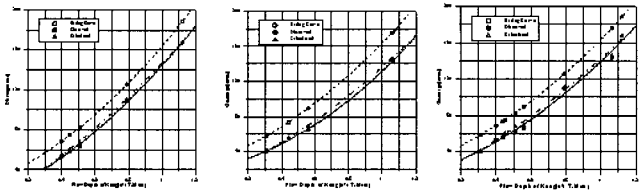
We had measured discharge considering change of water level during March □ May in

2003, March □ December in 2004. The results of measured discharge are shown in Table 17 and Table 18. Discharge(37.38□167.5 CMS) at all cross section is very well measured as shown in Table 17 and Table 18, but measured discharge is very much difference of computed discharge using Kong-Ju T/M gauging station's rating curve. Although this study area is very short, there is a difference of measured discharge and computed discharge using rating curve. Because there is hydraulic structure at about 100m point front of T/M gauging station which is occurred ineffective area in some area measuring discharge. So, we have guess that discharge for low water level is unsuccessfully measured. Therefore there is no reliability rating curve of Kong-Ju T/M gauging station for low water level.



(a) 2003yr (b) 2004yr (c) 2003 ~2004 yr

Fig 8 Comparison of dischage btween Rating curve and program

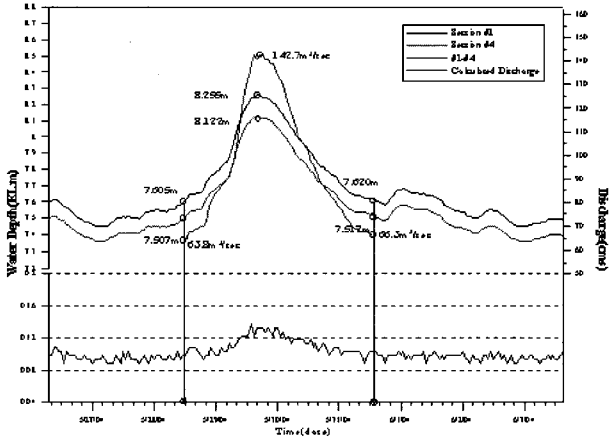


Fig 9. Example of Estimation discharge ('04 5/28 11:00 ~'04 5/31 14:00)

Simulated discharge using developed system in this study and computed discharge rating curve are shown in figure 35. As shown in figure 35, simulated discharge using developed system in this study is more similar to observed discharge than computed discharge using rating curve. Computed discharge using rating curve is more than observed discharge, but water level is the higher, computed and observed discharge become closer. Because there is no reliability computed discharge for low water level.

Keywords : Roughness coefficient; Stream discharge estimation; Rating curve; Water level & slope