Quantitative Diagnosis of the Water Shortage in Imsil of Korea During the Dry Spell

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The variations (1975-2008) of Available Water Resources Index (AWRI) calculated by daily precipitation from Imsil observatory in Korea and the water level of Seomjin Dam near the observatory had been compared in order to analyze the degree of water shortage during dry spell.

Dry spell (the period that AWRI descends less than 150mm) in lmsil was defined from February 19 to June 6 in average. And water shortage days (the day that AWRI descends less than 100mm) concentrated in this period but sometimes extended to summer. In the year of low AWRI, the water level of the Dam is low in average but long temporal gap exists between the minimum days of the two (April 4 and June 26, respectively). It is guessed that the cause of this difference be due to the increase of water for agricultural purpose in this season. The equivalent level of AWRI to the partially limiting level (166.4m) of water release at Seomjin Dam was 82mm, which was confirmed that the water level of the Dam can be predicted by long term precipitation data.

During dry spell, the highest frequency (total 88 days) of water shortage days was recorded in 1995 which is the next year of 1994 summer drought. In this year, the minimum AWRI and the water level of the Dam during dry spell were 65.9mm and 167.3m, respectively (all of the two values are the 2nd lowest of all years). And the lowest AWRI and the lowest water level of the Dam were recorded in 1978(62.0mm and 163.5m, respectively). In this year, the frequency of water shortage days was 68 days (the 2nd highest of all years). And except for dry spell, the years recorded the lowest AWRI and the lowest water level of the Dam, which occurred with summer drought, were 1992(July 9, 72.1mm) and 1994(September 23, 157.9m).

Keywords: Hydrological drought; AWRI; Water shortage; Water level of Dam