

Establishing of YESystem in the Yongdam Experiment Basin

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1. Introduction of Yongdam Experiment Basin

Basic survey of water resources is very important at water management. Therefore basic survey of water resources need to be implemented preferentially. To acquire reliable data, continuous and systematic operation is necessary. However, long-term operation is difficult owing to lack of budget in Korea. Since 2001, K-water Institutes assigned Yongdam dam to experiment watershed and have continued to conduct research.

2. States of Yongdam Experiment Basin

Yongdam Experimental Basin operate 6 gauging stations, 6 soil moisture observatory and one flux tower. All data from every station is collected by supervisor at the field excluding Dong hyang and Chun chun gauging station. Water level and soil moisture data is collected every month. And data collecting has been conducted every 3 weeks by supervisor. Observational data is provided as public service at homepage of Yongdam Experimental Basin and distributed through a yearly magazine named Yongdam Experimental Basin Operation White Paper. But there are difficulty such as data check and calibration in real time.

[Table 1] Water level gauging station

Name of Observatory	Longitude	Latitude	Elevation(EL. m)	Basin area(km ²)
Dong-Hyang	127°32'48"	35°49'49"	291.5	165.5
Chun-chun	127°31'48"	35°47'09"	273.5	289.8
Ju-chun	127°25'58"	35°58'03"	272.2	55.3
Suk-jung	127°26'24"	35°51'16"	267.1	85.6
Do-chi	127°27'10"	35°48'17"	270.2	32.6
Yang-ak	127°35'25"	35°51'04"	342	42.2

[Table 2] Soil moisture observatory

Name of Observatory	Longitude	Latitude	Elevation(EL. m)	Start of Observation	Sensor Type
An-chun	127°32'48"	35°52'01"	313	'13-04-17	TDR sensor
Ju-chun	127°25'34"	35°58'04"	303	'13-04-16	TDR sensor
Bu-kwi	127°24'12"	35°51'36"	396	'13-04-16	TDR sensor
Sang-jun	127°29'10"	35°48'11"	334	'13-04-17	TDR sensor
Ke-buk	127°37'46"	35°48'27"	453	'13-04-17	TDR sensor
Chun-chun	127°30'49"	35°40'54"	409	'13-04-18	TDR sensor

[Table 3] Flux tower

Name of Observatory	Longitude	Latitude	Elevation(EL. m)	Start of Observation	Observation system
Deogyu mountain flux tower	127°43'02"	35°51'53"	688	'11-04-01	Eddy Covariance Method

3. Establishing of YESystem(Yongdam Experimental System)

3.1. Establishing of CDMA system

Establishing system need to increase reliability and systematic management. To check data in real time, CDMA system will be established at gauging station and soil moisture observatory. Reliability of data will increase through checking of field data and transmission in real time. Also CDMA system is easily able to update accurate data through homepage.

3.2. Improvement and Application of K-DRUM

K-DRUM based on physical kinematic wave was developed by K-water to simulate temporal and spatial distribution of flood discharge considering grid rainfall and grid based GIS hydrological parameters. Using accumulated data, K-DRUM will be improved and optimized at Yongdam Experimental Basin. K-DRUM will be verified through comparison with simulation result by K-DRUM and observation data such as evapotranspiration and soil moisture.

3.3. Establishing of YESystem

Data Base will be established about observation data and data by K-DRUM. Public Information Service based on Web will offer reliable data to people who interested in Yongdam Experimental Basin. YESystem will provide Observation data and processed data by K-DRUM at homepage of Yongdam Experimental Basin.

4. Establishing of YESystem(Yongdam Experimental Sytem)

K-water Institutes will provide reliable data from Yongdam experiment watershed through establishing YESystem. YESystem is not only updating data in real time by CDMA, but also providing data by K-DRUM Model. YESystem is expected to be role-model of experiment watershed in Korea.

5. Reference

- [1] S.I Kwon, H.S Chae, H.J Shin, and K.S Lim, "Building River Spatial Information System based on GIS", KWRA, KWRA2013, pp. 45