

**KALIBRASI BANGUNAN UKUR DEBIT DAN *AUTOMATIC WATER*
LEVEL MONITORING SYSTEM (AWLMS) DI DAERAH IRIGASI SAPON,
KULON PROGO, DAERAH ISTIMEWA YOGYAKARTA**
INTISARI

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Dalam sektor pertanian, ketersediaan air yang cukup dan teratur adalah kunci untuk hasil panen optimal. Penelitian ini bertujuan mengkalibrasi *Automatic Water Level Monitoring System* (AWLMS) berbasis Internet of Things (IoT) yang digunakan untuk mengukur debit air pada modernisasi irigasi. Penelitian dilakukan di Daerah Irigasi Sapon, Kulon Progo, Yogyakarta. Bangunan ukur yang dikalibrasi adalah bangunan ukur intake yang dikalibrasi di lapangan dan bangunan ukur pada model saluran sekunder. Kalibrasi dilakukan pada dua parameter. Pertama, hasil pengukuran tinggi muka air terukur dengan sensor AWLMS dikalibrasi dengan pengukuran papan duga tinggi muka air. Kedua hasil pengukuran debit dengan metode aliran kritis dikalibrasi dengan metode velocity area dengan pelampung di lapangan dan metode volumetrik di laboratorium. Analisis data menggunakan regresi linier menunjukkan tidak ada perbedaan signifikan pada semua hasil pengukuran tinggi muka air yang ditandai dengan nilai R^2 0,9955. Semua metode pengukuran debit, baik bangunan ukur, pelampung, maupun volumetrik, memberikan hasil konsisten dan dapat diandalkan yang ditunjukkan dengan nilai koefisien R^2 yaitu 0,9948. Ketelitian pengukuran debit dipengaruhi oleh faktor infrastruktur, operasi, pemeliharaan, dan lingkungan. Implementasi teknologi modern seperti AWLMS meningkatkan keandalan dan efisiensi manajemen irigasi, mendukung pertanian berkelanjutan, dan mengatasi tantangan penurunan ketersediaan air.

Kata kunci: modernisasi irigasi, debit, AWLMS, kalibrasi, bangunan ukur

Calibration of Discharge Measurement Structures and the *Automatic Water Level Monitoring System* (AWLMS) in the Sapon Irrigation System, Kulon Progo, Special Region of Yogyakarta

ABSTRACT

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In the agricultural sector, sufficient and well-controlled water availability is crucial for optimal crop yields. This study aimed to calibrate the IoT-base Automatic Water Level Monitoring System (AWLMS) which utilized to measure discharge in irrigation modernization. The research was conducted in Sapon Irrigation System, Kulon Progo, Yogyakarta. The measuring structures calibrated were intake measuring structure and secondary measuring structure which were calibrated in the field and in the laboratory, as model, respectively. The calibration employed two parameters. First, the water levels measured in AWLMS were calibrated using gauge. Second, the discharges measured using critical-flow method in measuring structures were calibrated using velocity-area method in the field and volumetric method in the laboratory. Data analysis using regression showed no significant difference among all set of water level measurements, indicated by an R^2 value of 0,9955. All discharge measurements using measuring structures, float and volumetric were consistent and reliable, as demonstrated by an R^2 value of 0,9948. Accuracy of discharge measurement is influenced by infrastructure condition, operation and maintenance, as well as environmental factors. The implementation of modern technology such as AWLMS enhances the reliability and efficiency of irrigation management, supports sustainable agriculture, and addresses the challenges of declining water availability.

Keywords: *irrigation modernization, IoT technology, AWLMS, discharge measurement structure calibration*