



“Gheorghe Asachi” Technical University of Iasi, Romania



ESTIMATING STREAM FLOW VARIABILITY OF ALIYAR SUB BASIN USING SWAT MODEL

Guhan Velusamy^{1*}, Geethalakshmi Vellingiri², Raviraj Ayyavoo³,
Bhuvaneshwari Kulandaivelu⁴, Kowshika Nagarajan⁵, Marimuthu Mariappan⁶

¹Meteorological Centre, Hyderabad, India

²Tamil Nadu Agricultural University, Coimbatore, India

³Agricultural Engineering College and Research Institute, TNAU, Coimbatore, India

⁴Directorate of Crop Management, TNAU, Coimbatore, India

⁵Exilir Consultancy, Tiruchirappalli, India

⁶ICAR-KVK, Tiruchirappalli, India

Abstract

Irrigated agriculture has also faced the grimace of crop failure even though it ensures food security and marked rural welfare. SWAT was used in this study to quantify the water input and release patterns from the Aliyar reservoir. European Centre for Medium-Range Weather Forecast (ECMWF) reanalysis Interim (ERA-I) information accessible at a 0.75° resolution was utilized from 1981 to 2017. Based on the availability of the data, streamflow data from 2006 to 2009 was used for calibration, and streamflow data from 2010 to 2012 was used for validation were used in this study. Results of the water release pattern of the Aliyar reservoir indicated that the command area could be supported for 120 to 135 days, 123 to 134 days, and 60 days under excess, normal, and deficit rainfall conditions for the Aliyar sub-basin. This indicates that the crop selection must follow the water release pattern to maximize productivity and the influence of drought could be eradicated. The stream flow discharge with release pattern information generated from the study could be used to decide the time of sowing, the type of crop to be sown, the selection of varieties, and effective water management practices. This information could be used as input, coupled with the seasonal weather forecast information for river basin management and to predict future climate change impacts on water availability in the reservoirs.

Key words: calibration, hydrology, modelling, simulation, validation, watershed

Received: April, 2023; *Revised final:* June, 2024; *Accepted:* July, 2024; *Published in final edited form:* January, 2025

* Author to whom all correspondence should be addressed: e-mail: guhanthiran@gmail.com