Name	**Dr. ANU VARUGHESE**
Address	Assistant Professor
	Kelappaji College of Agricultural Engineering and Technology
	Tavanur (P.O) Malappuram (Dt), Kerala – 679 573
	Ph:9495174921; e-mail: anu.varughese@kau.in

Education

Degree	Year	University
Ph. D (Soil & Water Engg.)	2016	Kerala Agricultural University
M.Tech (Soil & Water Engg.)	1997	Kerala Agricultural University

Experience

Worked as Research Fellow in a research project "Soil solarization for weed control" at KCAET, Tavanur, for 3 years from June 1995 to May 1998.

Worked as Post Graduate Apprentice under National Watershed Development Project for Rainfed areas at Krishi Bhavan, Ayroor under Department of Agriculture, Kerala from May 2000 to October 2000.

Worked as Research Associate under "Precision Farming Development Centre", KCAET, Tavanur, under Kerala Agricultural University from 31-10-2000 till 24.11.2008.

Working as Assistant Professor in the Department of Irrigation and Drainage Engineering, KCAET, Tavanur, under Kerala Agricultural University from 25.11.2008 till date.

Teaching Credentials

Courses handled for B Tech (Agrl. Engg): Irrigation Engineering, Hydrology, Drainage Engineering, Ground Water Wells and Pumps, Watershed Hydrology, Building Technology, Design & maintenance of Greenhouse, Sprinkler and Micro irrigation systems, Irrigation Equipment Design, Watershed Management, Seminar, Skill Development Training–I (Student READY), BTech Project.

Courses handled for M Tech: GIS & Remote Sensing for Land & Water Resource Management, Design of Farm Irrigation Systems, Ground Water Engineering, Watershed Hydrology, Open channel Flow, Farm structures & Environment Control, Disaster Management, Masters Research.

Courses handled for PhD: Soil and Water Systems Simulation and Modelling, Advanced GIS & Remote Sensing for Land & Water Resource Management, Dimensional Analysis and Similitude in Engineering, Disaster Management.

Research Credentials

Major Research areas

　　　Climate change impact on river basin hydrology using SWAT model

　　　Precision farming, micro irrigation and fertigation

　　　IoT based irrigation automation systems

B.Tech Projects guided

1. An IoT based drip irrigation system for vertical farming in rainshelter

2. Artificial Neural Network model for prediction of runoff

3. Raising quality vegetable seedlings under controlled environment conditions.

4. Evaluation of different fertigation systems

5. Utilization of effluent from fish farms for cultivation in Aquaponics

6. Nutrient use efficiency in Okra in soil and soilless media using fertigation

7. Effect of different irrigation and fertigation levels on performance of Cowpea under polyhouse

8. Effect of different fertigation levels and drip layouts on the performance of Okra under plastic mulching

9. Water Audit of KCAET campus

10. Automatic water level datalogger and application for data analysis

11. Identification of shallow ground water areas in Thuthapuzha sub basin using GIS technology

M.Tech thesis guided

1. SWAT model evaluation using generated data and assessing the impact of land use changes

2. Estimation of soil moisture indices using diffuse reflectance spectroscopy

3. Modelling the impact of conservation structures and climate change on water yield in a watershed

4. Development and performance evaluation of vertical farming structures in rainshelter

5. Assessment of saline water intrusion from Ponnani to Tavanur along the course of river Bharathapuzha

6. Soil erosion and sediment yield assessment of Kunthipuzha sub-watershed using SWAT and RUSLE

Ongoing Research of PhD students

1. Climate change impact on operation policy and performance indices of a reservoir using machine learning techniques.

2. Potential site selection for water harvesting in a micro watershed with future water balance perspectives

Publications

Published 19 research articles in Peer reviewed journals, 12 research articles (full paper) in Conference proceedings, 5 Book chapters and 14 Popular articles/training manuals/leaflets.

Recent Publications

Hasna Ameena P. O., **Anu Varughese**, Gilsha Bai E. B., Rema K. P. 2023. Assessment of saline water intrusion in a coastal region of Kerala, India. *Environmental Engineering and Management Journal*. 22(3):607-618. http://doi.org/10.30638/eemj.2023.047

Anjaly C.S., Sathian K.K., **Anu Varughese** and Jinu A. 2023. Assessment and mapping of a shallow aquifer near an industrial belt using hydro chemical parameters and irrigation water quality index. *J. Agricultural Engineering* 60:(1). https://doi.org/10.52151/jae2023601.1797

Anu Varughese, Praveena K.K., Sruthakeerthi P, Rachana V.V. and C.V.Anjaly. 2022. Runoff Prediction of Bharathapuzha River Basin using Artificial Neural Network and SWAT model to *J. Agricultural Engineering (India)*. 59(4):404-416. https://doi.org/10.52151/jae2022594.1791

Hasna Ameena P.O., **Anu Varughese**, E.B.Gilsha Bai and S. Sajeena.2022. Assessment of Salt Water Intrusion from Ponnani to Tavanur along the Banks of River Bharathapuzha in Kerala. *J. Indian Soc. Coastal Agric. Res.* 40(2): 33-47 (2022) https://doi.org/10.54894/JISCAR.40.2.2022.128473

Prabhakar, M., Sasikala D, **Anu Varughese**. 2022. Assessment of Recharge in Shallow Groundwater Aquifers Using Soil and Water Assessment Tool: A Case Study of the Thuthapuzha Subbasin. *Int. J. of Environ. and climate change.* 12(8): 102-112. https://doi.org/10.9734/ijecc/2022/v12i830729

Anu Varughese and Hajilal M S.2022. Trends in Streamflow in Relation to Water Retention Structures: A Case Study in Bharathapuzha River Basin, India. *Int. J. of Environ. and climate change*. 12(5): 84-96. https://doi.org/10.9734/ijecc/2022/v12i530677

Fousiya and **Anu Varughese.** 2022**.** Modelling streamflow using SWAT model: a case study of Thuthapuzha river basin, Kerala. *International Journal of Farm Sciences*. 10(2). http://dx.doi.org/10.5958/2250-0499.2020.00040.3

Anu Varughese and Hajilal M S.2020. Impact of Climate Change on the Hydrology of Bharathappuzha River in Kerala, India. *Climate Change and Environmental Sustainability*.8(2). http://dx.doi.org/10.5958/2320-642X.2020.00018.6

Achievements/Awards

Received Best JAEI Research Paper Award 2023 of Indian Society of Agricultural Engineers, NewDelhi for the paper entitled "Runoff Prediction of Bharathapuzha River Basin using Artificial Neural Network and SWAT model to Anu Varughese, Praveena K.K., Sruthakeerthi P, Rachana V.V. and C.V.Anjaly. Published in the Journal of Agricultural Engineering (India) 2022. 59(4):404-416.

Sadhana Best Paper Award- 2020. Fousiya and Anu Varughese for the research paper "Modelling streamflow using SWAT model: a case study of Thuthapuzha river basin, Kerala" in the *International Journal of Farm Sciences*. 10(2): 86-95.

Winner of DR Banyal Memorial Best Paper Award-2019.Gilsha Bai, E.B., Rema, K.P., Sasikala, D., and Varughese, A for the research paper "Modelling the irrigation demand profile of Chalakudy river diversion scheme using CROPWAT and GIS tools" in the *International Journal of Farm Sciences*. 9(4): 52-62.

External Aided Projects (EAP's) Handled

1. Principal Investigator of the Precision Farming Development Centre, KCAET, Tavanur (May 2011 to Oct 2012)

2. Principal Investigator of the State Plan project for infrastructure development of Irrigation Engineering Lab of KCAET, Tavanur

3. Co- Investigator of the State plan project on Soil loss estimation and monitoring in the highland ecosystems of Kerala for effective conservation   planning.

4. Co-Investigator of the Precision Farming Development Centre, KCAET, Tavanur

Research and Development Activities

i) Strengthening of Irrigation Engineering lab with the purchase of Time Domain Reflectometer and other modern equipments.

ii) Co-ordinator of the online training courses of Indian Institute of Remote Sensing at KCAET, Tavanur

iii) Associate in the establishment of the Geospatial Laboratory at KCAET, Tavanur

Membership in Professional bodies

- 1. Life member of the Indian Society of Agricultural Engineers (ISAE)
  2. Member of the Institution of Engineers (MIE), India.
  3. Life member of Energy Conservation Society