

# Dr. Chitra Shukla

Assistant Professor

Irrigation and Drainage Engineering

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## Academic Qualification

Degree & Specialization	Board/University	Passing Year
<b>Ph. D.</b> <b>Land and Water Resource Engineering</b>	Indian Institute of Technology Kharagpur, West Bengal, India. <b>PhD Thesis Topic:</b> Impact Assessment of Plantations on Micro-watersheds Soil and Rainfall Partitioning	2023
<b>M. Tech.</b> <b>Irrigation and Water Management Engineering</b>	Maharana Pratap University of Agriculture and Technology Udaipur, Rajasthan, India. <b>M. Tech. Thesis Topic :</b> Scheduling of Irrigation for Capsicum Crop under Protected Cultivation.	2013
<b>B. Tech.</b> <b>Agricultural Engineering</b>	Acharya Narendra Deva University of Agriculture and Technology Faizabad, Uttar Pradesh, India.	2011

## Research/Teaching/Professional Experiences

[Total Experience: 08 Years 07 Months]

Designation/Post	Institute/Organization	Duration
<b>Assistant Professor (Guest Faculty)</b>	College of Agricultural Engineering Ara, Bhojpur, under Bihar Agriculture University Sabour, Bihar.	<b>1 Year and 4 Months</b> (Mar., 2023– July, 2024)
<b>Research Assistant</b>	Indian Institute of Technology Kharagpur, West Bengal.	<b>03 Months</b> (Jan, 02- Mar. 30, 2023)
<b>Teaching Assistant</b>	<b>Micro Irrigation Engineering</b> , course under NPTEL, Ministry of Education, Government of India.	<b>08 Months</b> (Mar., 2021-Oct., 2021)
<b>Teaching Assistant</b>	Land and Water Resources Engineering, Agricultural and Food Engineering Department, IIT, Kharagpur, India.	<b>01 Year</b> (Jan.-Dec, 2020)
<b>Senior Research Fellow</b>	Indian Institute of Technology Kharagpur, W.B. <b>Project Title:</b> Improving GW Levels and Quality through Enhanced WUE in Eastern Indian Agriculture.	<b>05 Years</b> (Jan., 2014 to Dec., 2018)
<b>Project Coordinator</b>	Aga Khan Rural Support Program (India), Gujarat. <b>Work Details:</b> Ensuring irrigation supply in villages comes under the CCA of Jhujh and Keliya Dam.	<b>04 Months</b> (Sept., 2013 to Jan., 2014)

## **Subjects Taught to B.Tech Agriculture Engineering Students (ICAR V<sup>th</sup> Dean Committee):**

1. Irrigation Engineering (Course Code: IDE-221; Credit 3(2+1))
2. Sprinkler and Micro Irrigation Systems (Course Code: IDE-222; Credit 2(1+1))
3. Drainage Engineering (Course Code: IDE-311; Credit 2(1+1))
4. Principles of Soil Science (Course Code: SOIL-111; Credit 3(2+1))
5. Communication Skills and Personality Development (Course Code: COM-211; Credit 2(1+1))
6. Environmental Science and Disaster Management (Course Code: COM-121; Credit 3(2+1))
7. Coordinated to facilitate the Skill development Training-1 (Course code: CAE-311, Credit hours: 05), 01 month training program to B. Tech Agriculture Engineering students at Northern Farm Machinery Training & Testing Institute (NFMT&TI), Hisar.

## **Administrative Skills:**

1. Conducted exposure visits and expert lectures for B. Tech Agriculture Engineering students throughout 2023-24 as Assistant Professor at CoAE Ara.
2. Served as a member on various college committees including Hostel, Cultural, Automatic Weather Station, Yoga, and Adopted Village FOR Malnutrition Eradication initiatives.
3. Anchored numerous cultural and training programs with proficiency.
4. Delivered presentations and lectures to farmers on farm mechanization, drip/sprinkler irrigation, and protected cultivation during training programs at CoAE Ara.
5. Engaged in voluntary service with the Austin Student Travel Grant Challenge Street Team during the American Geophysical Union Fall Meeting held during Dec. 9-13, 2019, in San Francisco, USA.

## **International Summer & Winter Terms (ISWT) Courses, Certificates and Diploma**

<b>Course of Study</b>	<b>Institute Name</b>	<b>Duration</b>
<b><u>Certificate:</u> Introduction to RSoftware</b>	IIT Kanpur	Sept.– Nov., 2020
<b><u>IWST:</u> Machine Learning and Complex Networks</b>	IIT Kharagpur	Feb -Mar, 2015
<b>Modeling River Catchment Interactions</b>	IIT Kharagpur	1-12 Jun, 2015
<b><u>IWST:</u> Hydrology and Climate Change</b>	IIT Kharagpur	01-11 Jul, 2014
<b><u>IWST:</u> Geospatial Technologies in Hydrological Modeling</b>	IIT Kharagpur	16-27 Jun, 2014
<b><u>Diploma</u> Advance Diploma in Computer Application</b>	Lucknow Computer Education, Lucknow.	Jan. 2011-Mar. 2012

## Academic Awards/Achievements

[Total Grant Amount (in Rupees) ≈ 06 Lacs]

1. **Best Paper Award** for a published journal paper “*Shukla, C., Bhakar, S. R., & Lakhawat, S. S. (2016). Development of the crop coefficient for capsicum (Capsicum annum L.) under protected structures. Journal of Agrometeorology, 18(2), 258-260*”.
2. **Student Travel Grant (worth \$1000)** from *American Geophysical Union* to attend *AGU Fall Meeting-2021*, in New Orleans, LA, USA.
3. **Student Travel Grant (worth \$1000)** from *American Geophysical Union* to attend *AGU Fall Meeting-2019* in San Francisco, CA, USA.
4. **AGU Ecohydrology Tiny Grants Award (worth \$125)** intended for young international ecohydrologist from *AGU Ecohydrology Technical Committee at AGU Fall Meeting 2019*.
5. **Student Travel Grant (worth \$1000)** from *American Geophysical Union* to attend *AGU Fall Meeting-2018* in Washington D. C., USA.
6. **International Travel Grant (worth Rupees 79,960)** from *Information Technology Research Academy, Department of Electronics and Information Technology, Govt. of India*, to attend *AGU Fall Meeting 2018*, Washington D. C., USA. (Grant Ref. No.: [ITRA15\(106\)/ITR/2018/02](https://www.itra.ac.in/ITRA15(106)/ITR/2018/02)).
7. **Full financial assistantship (worth 2.46 lacs rupees)** from *IIT Kharagpur* under the category of *Best Academic International Conference to attend AGU Fall Meeting*, 11-15 Dec. 2017, at New Orleans, USA.

## Scholarships

1. Recipient of “**Ministry of Education**” Govt. of India Scholarships during PhD for Teaching Assistantship in developing a NPTEL online course entitled “Micro Irrigation Engineering” under the SWAYAM platform (<https://onlinecourses.nptel>).
2. Recipient of “**Ministry of Human Resource Development**” Govt. of India Scholarships during PhD for Teaching Assistantship in Agricultural and Food Engineering Department, IIT Kharagpur. (Jan. to Dec., 2020).
3. Recipient of “**Ministry of Human Resource Development**” Govt. of India Scholarships to pursue Ph. D. degree at IIT Kharagpur (2018-2019).
4. Recipient of “**Ministry of Communications and Information Technology**” Govt. of India fellowship for serving as Senior Research Fellow at IIT Kharagpur in project funded by Information Technology Research Academy (2014-2018).
5. Recipient of Merit Scholarship “**Government of Uttar Pradesh**” during B. Tech. degree (2007-11).

## Membership of Professional Organizations

1. Indian Society of Agricultural Engineers [Membership ID: LM-12867]
2. International Association of Hydrological Sciences [Membership ID: 19746]
3. International Water Resources Association (IWRA), Paris, France. [Membership ID: M-09944]
4. American Geophysical Union, USA. [Membership ID: 849787]

## **Research Interest**

1. Smart Farming and Precision Agriculture Technologies
2. Soil- Water-Plant-Atmosphere Relationship Studies;
3. Crop Water Requirement and Irrigation Scheduling,
4. Agricultural Watersheds Management and Water Balance Studies;
5. Hydrological Processes Parameters Monitoring and Modeling.

## **Scientific Applications/Software, Technical Instruments and Sensors Knowledge**

Operating System	Windows (all versions) & basics knowledge of Ubuntu
Technical Writing Tool	Microsoft office & Overleaf, Online LaTeX Editor
Scientific Applications	Basics of ERDAS Imagine 2013, DSS_ET & HYDRUS-1D
Statistical Tools/model	R language and SPSS, Advanced Excel
Technical Drawing	Sigma Plot, Origin Pro., and Grapher
GIS software	Basic study area map plotting in ArcGIS and QGIS
VOS viewer	Software tool for constructing and visualizing bibliometric networks
Advanced Instruments	Ion Chromatograph, Spectrophotometer, Digital Stage Level Recorder, PressurePlate Apparatus, Infiltrimeter.
Sensor	Soil Moisture Probes (TDR & FDR), Plant Canopy Analyzer, Water Level Indicator.

## **Research Trainee**

1. ArcGIS 2 (Environmental Systems Research Institute (ESRI), India. (Nov, 2017)
2. Soil and Water Conservation Department, Kanpur, Uttar Pradesh. (Jul- Aug, 2012)
3. Central Soil Salinity Research Station, Lucknow, Uttar Pradesh. (Feb-Jun, 2011)
4. Northern Region Farm Machinery Training & Testing Institute Haryana. (August 2010)
5. Central Institute of Post-Harvest Engineering and Technology (ICAR), Punjab. (Jun-Jul, 2009)

## **Participation in Workshops/Seminars**

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1. Workshop on “Publishing in Academic Journals: An Author’s Workshop” jointly organized by Central Library, *Indian Institute of Technology Kharagpur and Taylor and Francis Group* on 18th Sept., 2019.
2. National seminar on “Fly Ash Based Amendments for Amelioration of Degraded Soils to Increase Crop Production in the Gangatic Plains” organized by *National Institute of Ecology, New Delhi & Central Soil Salinity Research Institute, Regional Research Station, Lucknow* on 7th -8th May 2011.
3. Author’s Workshop jointly organized by *Springer and Indian Institute of Technology Kharagpur* on 16<sup>th</sup> January 2015.

1. Pandey, B. K., **Shukla, C.**, Sillanpää, M., & Shukla, S. K. (2023). A systematic review on application of electrokinetics in stabilization and remediation of problematic soils. *Innovative Infrastructure Solutions*, 8(9), 226. **[Impact Factor: 2.4]**
2. **Shukla, C.**, Gupta, D., Pandey, B. K., & Bhakar, S. R. (2023). “Suitability assessment of different cladding materials for growing bell pepper under protected cultivation structures using multi-criteria decision-making technique”. *Environment, Development and Sustainability*, 1-21. **[Impact Factor: 2.4, NAAS: 9.79]**
3. Shukla, C., Tiwari, K. N., & Mishra, S. K. (2023). Establishment of rainfall partitioning parameters for tea plantations. *Hydrological Sciences Journal*, 68(6), 873-885. **[Impact Factor: 4.7, NAAS: 9.92]**
4. **Shukla, C.**, Tiwari, K. N., & Mishra, S. K. (2022). Multi-point sampling for improved throughfall measurement from tree plantations. *Trees*, 36(1), 241-259. ([DOI: 10.1007/s00468-021-02202-y](https://doi.org/10.1007/s00468-021-02202-y)). **[Impact Factor: 2.6, NAAS: 8.53]**
5. **Shukla, C.**, Bhakar, S. R., Acharya, S. K., & Jamrey, P. K. (2019). Impact of various micro climates on the physiological parameters and yield of capsicum (*Capsicum annuum* L.). *Indian Journal of Soil Conservation*, 47(2), 143-147. **[NAAS: 5.28]**
6. **Shukla, C.** Bhakar, S. R., Acharya, S. K., (2018). Estimation of Water Requirement of Capsicum Crop Grown Under Shade Net House and Insect Net House. *International Journal of Agriculture Sciences*, ISSN, 0975-3710. **[NAAS: 4.58]**
7. **Shukla, C.**, Bhakar, S. R., & Lakhawat, S. S. (2016). Development of the crop coefficient for capsicum (*Capsicum annuum* L.) under protected structures. *Journal of Agrometeorology*, 18(2), 258-260. **[NAAS: 6.55]**

**Publications in Conferences/Book Chapters**

1. **Shukla, C.**, Chhetri P., and Santosh D. T. (2024). Managing Abiotic Stress in Controlled Green House Environments. *Advances in Modern Agricultural Practices*, New Delhi Publisher (pp. 145-162). ([ISBN:9788119006953 \(Print\)](https://doi.org/10.1007/978-81-1900695-3); [EISBN:9788119006892 \(eBook\)](https://doi.org/10.1007/978-81-1900689-2))
2. Santosh D. T. and **Shukla, C.**, (2024). Innovation in Aquaponics: Components, Operations and Economic Viability. *Advances in Modern Agricultural Practices*, New Delhi Publisher (pp. 207-222). ([ISBN:9788119006953 \(Print\)](https://doi.org/10.1007/978-81-1900695-3); [EISBN:9788119006892 \(eBook\)](https://doi.org/10.1007/978-81-1900689-2))
3. Santosh D. T. and **Shukla, C.**, (2024). The Impact of Plastic Mulch on Soil Health and Crop Productivity in Agriculture. *Advances in Modern Agricultural Practices*, New Delhi Publisher (pp. 265-278). ([ISBN:9788119006953 \(Print\)](https://doi.org/10.1007/978-81-1900695-3); [EISBN:9788119006892 \(eBook\)](https://doi.org/10.1007/978-81-1900689-2))
4. **Shukla, C.** and Pandey, B.K. (2022). A systematic Review on Application of Electrokinetics in Treatment of Problematic Soils. Indian Geotechnical Conference (IGC)-2022, Kochi, India. ([Accepted with paper id: TH-9-54](#)).
5. **Shukla, C.**, Tiwari, K. N., & Singh, G. (2021, November). Measurement of soil properties and

surface hydrology parameters to assess the variation induced by different plantations. *IEEE International Workshop on Metrology for Agriculture and Forestry*, pp. 215-220. IEEE.  
[DOI: 10.1109/MetroAgriFor52389.2021.9628825](https://doi.org/10.1109/MetroAgriFor52389.2021.9628825).

6. **Shukla, C.,** Gupta, D., & Bhakar, S. R. (2021, November). Comparison of various methods for estimation of reference evapotranspiration under four different precision farming structures. *IEEE International Workshop on Metrology for Agriculture and Forestry*, pp. 97-101. IEEE.  
[DOI: 10.1109/MetroAgriFor52389.2021.9628445](https://doi.org/10.1109/MetroAgriFor52389.2021.9628445).
7. **Shukla, C.,** Tiwari, K. N., & Mishra, S. K. (2022). Influence of Stemflow Measurement on Interception Estimation Under Eucalyptus Plantations. In *Sustainability of Water Resources* (pp. 25-36). Springer, Cham.

### **Book Published**

1. Shukla, C., Patel, A., Lohar, A., & T, S. D. (2024). *Modern Technologies for Protected Cultivation*. Satish Serial Publishing Houses. ([ISBN: 978-81-19105-78-6](#); [EISBN: 978-81-19105-39-7](#))

### **National and International Conferences**

1. **Shukla C.,** Tiwari K. N., and Mishra S. K. (2022), “Measurement and modelling of rainfall partitioning parameters for five different fruit plantations” *American Geophysical Union (AGU) Fall Meeting* at Chicago, USA. ([Abstract ID: 1146242](#))
2. **Shukla C.,** Tiwari K. N., and Mishra S. K. (2022), “Suitability assessment of different cladding materials for growing bell pepper under protected cultivation structures using multi-criteria decision making technique” *American Geophysical Union (AGU) Fall Meeting* at Chicago, USA. ([Abstract ID: 1162133](#))
3. **Shukla C.,** Tiwari K. N., and Mishra S. K. (2021), “Identification of most suitable throughfall measurement locations under large radius tree canopies using the time invariant analysis”. *American Geophysical Union (AGU) Fall Meeting* at New Orleans, USA. ([Abstract ID: 961780](#))
4. **Shukla C.,** Tiwari K. N., and Mishra S. K. (2021), “Rainfall partitioning for Tea plantation grown under tropical savanna climate”. *AGU Fall Meeting* at New Orleans, USA. ([Abstract ID: 965017](#))
5. **Shukla C.,** Tiwari K. N., and Singh G. (2021), “Measurement of soil properties and surface hydrology parameters to assess the variation induced by different plantations” *IEEE International Workshop on Metrology for Agriculture and Forestry*, Trento-Bolzano, Italy during 3 - 5 Nov., 2021.
6. **Shukla, C.,** Bhakar, S. R., & Debaditya Gupta (2021) “Comparison of various methods for estimation of reference evapotranspiration under four different precision farming structures” *IEEE International Workshop on Metrology for Agriculture and Forestry*, Trento-Bolzano, Italy during 3 - 5 Nov., 2021.
7. **Shukla C.,** Tiwari K. N., and Mishra S. K. (2021) “Influence of stemflow measurement on interception estimation for Eucalyptus plantation” International e-conference on Water Source Sustainability organized by the *Indian Water Resources Society (IWRS) and Department of Water Resources Development and Management, IIT Roorkee*.
8. **Shukla C.,** and Tiwari K. N. (2019) “Design of throughfall monitoring setup for tree stands” *AGU*

*Fall Meeting* held at Moscone Convention Center in San Francisco, CA, USA, during 09-13 Dec. 2019. ([Bibcode: 2019AGUFM.H23J2022S](#))

9. **Shukla C.**, and Tiwari K. N. (2019) “Effect of long-term existence of tree stands and its litter decomposition on soil properties” *AGU Fall Meeting* held at Moscone Convention Center in San Francisco, CA, USA, during 09-13 Dec. 2019. (Bibcode: 2019AGUFM.GH44A..05S)
10. **Shukla C.**, and Tiwari K. N. (2019) “Design and installation of in-situ low-cost surface runoff monitoring set up for small watersheds” *International Symposium on “Advances in Agrometeorology for Managing Climatic Risks of Farmers*, 11-13 Feb, 2019 New Delhi, INDIA.
11. **Shukla C.**, and Tiwari K. N. (2018) “Instrumentation for vadose zone hydrological studies at agricultural micro watershed” *AGU Fall Meeting*, 10-14 Dec. 2018 Washington D. C., USA.
12. **Shukla C.**, Tiwari K. N. and Pahade D. (2018) “Measurement of rainfall interception and canopy effects on stemflow and throughfall under nine mature tree stands” *ASABE*, 3-6 Oct. 2018, Taj Krishna, Hyderabad, India.
13. Tiwari K. N., **Shukla C.**, Pradhan S and Pahade D. (2018) “Influence of Plantation Crops on Hydrological Processes” *International Conference on Sustainable Technologies for Intelligent Water Management at IIT Roorkee*.
14. **Shukla C.** and Tiwari K. N. (2017) “Complex linkage between soil, soil water, atmosphere and Eucalyptus Plantations” *AGU Fall Meeting*, 11-15 Dec. 2017, at New Orleans, USA.
15. **Shukla C.**, and Tiwari K. N. (2016) “Soil Hydrology of Micro Watersheds with different Plantation Crops” International Conference on “Emerging Technologies in Agricultural and Food Engineering” (ETAE 2016), IIT Kharagpur.

## References

<b>Dr. K. N. Tiwari</b> ( <i>Ph.D. supervisor</i> )	<b>Dr. S. K. Mishra</b>
Professor (HAG)	Former Bharat Singh Chair Professor
Agricultural and Food Engineering Department	Professor (HAG) and Former Head
IIT Kharagpur, West Bengal, India.	Department of Water Resources Development and Management, IIT Roorkee, Uttarakhand, India.
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I hereby declare that the above-mentioned details are true to the best of my knowledge.

**Place: Meerut, Uttar Pradesh**

**Date: November, 2024**

**(Dr. Chitra Shukla)**