

Abhijeet Abhishek, Ph.D.

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Summary

- Versatile and adaptable researcher with 6+ years of experience in Agriculture Production, Agronomy, Water Resources Management, GHGs, Carbon Sequestration, Climate Change, and Sustainability Practices using Digital Technology Solutions & Product Development.
- Awareness of the current industry trends with experience in experimental techniques, product design, data analytics, field trials, modeling approaches, and project management skills leading cross-functional teams to drive innovation and improve sustainability.
- Mentored 6 junior PMs, led cross-functional teams of 15 people, effectively communicating at 12 stakeholder engagements, collaborating with scientists, policy makers, and industry experts on 4 sustainability projects, and drafted 6 technical reports, 5 research articles, and presented at 6 scientific conferences.

Education

Doctor of Philosophy, Ph.D.	Oct 2023
Michigan State University	
Major in Agriculture and Water Resources Engineering, Civil and Environmental Engineering	
Master of Science, M.S.	Dec 2018
Michigan State University	
Major in Agriculture and Water Resources Engineering, Civil and Environmental Engineering	
Bachelor of Engineering, B.E.	May 2015
Siksha 'O' Anusandhan University	
Major in Water Resources Engineering, Civil and Environmental Engineering	

Work Experience

Research Associate	Jan 2017 to May 2024
Michigan State University	
<ul style="list-style-type: none">■ Developed and implemented an advanced integrated modeling framework, improving crop yield forecasting and resource use efficiency in agricultural systems by 12%.■ Employed agricultural models such as DSSAT, APSIM, and CropSyst to analyze commercial and research data, identifying key agricultural trends and correlations, enhancing targeted yield forecasting and optimization.■ Improved the prediction capabilities of hydrologic and crop models by 14% using remote sensing, data assimilation, field research, GIS, data modeling, qualitative analysis, enhancing accuracy in forecasting water-related events.	

- Led the integration of data-driven agricultural practices, using GIS and remote sensing to enhance soil and water management, achieving a 7% improvement in water use efficiency.
- Utilized remote sensing SAR data to accurately predict optimal planting times, pest outbreaks, and yield forecasts, leading to smarter, evidence-based agricultural decisions.
- Organized 4 training workshops for growers, consultants, and other stakeholders, promoting cross-functional collaborations, and strong record of writing research articles and technical reports.
- Developed comprehensive climate risk assessments to guide the regional adaptation strategies for staple crop such as rice and maize under varying climatic conditions in Southeast Asia and Africa.
- Conducted comprehensive field investigations to monitor crop growth, land cover changes, soil health and moisture conditions, and perform pest and disease surveillance, surface water/groundwater sampling, and laboratory analysis over different regions in US-Midwest.
- Process improvisation and automation expertise with proficiency in handling large datasets, model validation, data mapping, single & multi-model analyses, and satellite data processing, achieving compliance with industry standards and reducing project timelines by 6%.

Computational Scientist/Data Analyst

Jul 2018 to Aug 2018

NASA Jet Propulsion Laboratory

- Applied precision agriculture techniques using Geospatial Tools, GIS/GPS and IoT sensors, enhancing water and nutrient application efficiency by 7%, leading to improved food production and reduced environmental footprint.
- Designed, developed, and deployed 4 state-of-the-art field sensors and digital tools to record critical agronomic data, validating sensor data against satellite observations across diverse land covers, which improved SMAP's soil moisture retrieval accuracy by 5% and drove on-farm productivity targets.
- Enhanced crop model performance by 10% through extensive calibration and validation using ground-truth data from field sensors and remote sensing imagery, leading to reliable crop management strategies and water use efficiency in Southeast Asia and Africa.

Project Assistant

May 2016 to Aug 2016

Indian Institute of Technology

- Led weekly field campaigns across 45 sampling locations in the Rana watershed, India, covering an area of 500 sq. km, to collect soil moisture data, soil samples, leaf area index (LAI), and plant health indicators in rice paddy fields.
- Designed and executed field trials to assess the impact of various crop management practices, integrating findings into extension programs aimed at improving local agricultural practices.

- Analyzed 80+ water and soil samples from various wells and landcovers, employing laboratory techniques to inform watershed dynamics and landcover analysis.

Project Assistant

May 2014 to Jun 2014

Indian Institute of Science

- Collaborated with multidisciplinary teams on 2 environmental projects, contributing to the development of evidence-based conservation practices and policies, impacting over 24,000 acres of conservation land in Berambadi watershed, India.
- Engaged extensively with growers and stakeholders to promote and implement regenerative agricultural practices, significantly enhancing biodiversity and reducing environmental impacts.
- Utilized AutoCAD and Microsoft Suite for agricultural project design, documentation, and communication, enhancing the implementation and management of sustainable farming solutions.

Engineering Intern

May 2013 to Jul 2013

P.P&F, Secha Sadan, Water Resources Department

- Partnered with multidisciplinary teams to spearhead the planning, design, and successful implementation of water resource management projects, achieving compliance with industry standards, and reducing project timelines by 7%.
- Prepared design calculations, drawings, specifications, and cost estimates for constructing a barrage in Odisha, India.
- Assisted senior engineers in planning and execution, applying advanced modeling and spatial analysis to enhance project accuracy by 4%, delivering precise and actionable insights for project development.

Projects

NASA-USAID SERVIR Project

Jan 2017 to Dec 2023

- Involved in the NASA SERVIR project, focusing on developing sustainable solutions for food security, agricultural productivity, and water resources management amidst climate change challenges in Southeast Asia and Africa.

NASA- Citizen Science Project

May 2017 to May 2020

- Engaged in an extensive field campaign for the NASA-Citizen Science project, focusing on data collection and analysis through innovative, data-driven approaches for disaster resilience and effective resource management.

ITRA, DST-SPLICE, and Climate Change Program

May 2016 to Aug 2016

- Developed and applied optimal sampling strategies and data analysis techniques, contributing to sustainable water resource management in response to climate variability.

- Collaborated in Indo-French AICHA project, developing innovative approaches to sustainable crop management, combining traditional practices with scientific techniques to optimize resource use and bolster crop resilience.

Publications

- **Abhishek, A.**, Das, N. N., Andreadis, K. M., & Phanikumar, M. S. (2024). Improving the Crop Yield Prediction Capabilities: Assimilating SMAP and MODIS Observations into an Integrated Modeling Framework. *Water Resources Research*, Under Review.
- **Abhishek, A.**, Das, N. N., & Phanikumar, M. S. (2024). A Critical Review on Data Assimilation Techniques in Hydrologic-Crop Models. *Journal of Hydrology*, Under Review.
- **Abhishek, A.** (2023). Dynamics of Seasonal Crop Yield Prediction Under Weather and Climate Extremes. Michigan State University.
- **Abhishek, A.**, Phanikumar, M. S., Sendrowski, A., Andreadis, K. M., Hashemi, M. G., Jayasinghe, S., ... & Das, N. N. (2023). Dryspells and Minimum Air Temperatures Influence Rice Yields and their Forecast Uncertainties in Rainfed Systems. *Agricultural and Forest Meteorology*, 341, 109683. <https://doi.org/10.1016/j.agrformet.2023.109683>
- Hashemi, M. G., **Abhishek, A.**, Jalilvand, E., Jayasinghe, S., Andreadis, K. M., Siqueira, P., & Das, N. N. (2022). Assessing the impact of Sentinel-1 derived planting dates on rice crop yield modeling. *International Journal of Applied Earth Observation and Geoinformation*, 114, 103047. <https://doi.org/10.1016/j.jag.2022.103047>
- **Abhishek, A.**, Das, N. N., Ines, A. V., Andreadis, K. M., Jayasinghe, S., Granger, S., ... & Phanikumar, M. S. (2021). Evaluating the impacts of drought on rice productivity over Cambodia in the Lower Mekong Basin. *Journal of Hydrology*, 599, 126291. <https://doi.org/10.1016/j.jhydrol.2021.126291>
- **Abhishek, A.** (2018). Monitoring the Effects of Drought on Crop Yield in the Lower Mekong Basin. Michigan State University.
- **Abhishek, A.** (2015). Environmental Aspect of Green Building Design. Siksha 'O' Anusandhan University.

Conferences

- **Abhishek, A.**, Phanikumar, M. S., Sendrowski, A., Andreadis, K. M., Hashemi, M. G., Jayasinghe, S., ... & Das, N. N. (2023). Dryspells and Minimum Air Temperatures Influence Rice Yields and their Forecast Uncertainties in Rainfed Systems. *Agricultural and Forest Meteorology*, 341, 109683.
- **Abhishek, A.**, Das, N. N., Andreadis, K. M., Phanikumar, M., Brent, R. J., & Jayasinghe, S. (Dec 2022). Exploring the Efficacy of Seasonal Climate Forecasts on Interannual Crop

Yields for Agriculture Sustainability. American Geophysical Union (AGU) Fall Meeting, Chicago, IL, USA.

- **Abhishek, A.**, Das, N. N., Andreadis, K. M., Jayasinghe, S., Brent, R. J., & Phanikumar, M. (Dec 2021). Exploring the Efficacy of Seasonal Forecasts of Crop Yields for Agriculture Sustainability. American Geophysical Union (AGU) Fall Meeting, New Orleans, LA, USA.
- **Abhishek, A.**, Das, N. N., Ines, A. V., Andreadis, K. M., Jayasinghe, S., Granger, S., ... & Phanikumar, M. S. (Dec 2019). Understanding the Regional Implications of Drought on Rice Yields over the Lower Mekong Region. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, USA.
- Das, N. N., Andreadis, K. M., Ines, A. V., & **Abhishek, A.** (Nov 2018). Monitoring and Forecasting Drought and Crop Yield for the Lower Mekong Basin. SERVIR Annual Global Exchange (SAGE), Lisbon, Portugal.
- **Abhishek, A.**, Das, N. N., Ines, A. V., Andreadis, K. M., Jayasinghe, S., Granger, S., ... & Phanikumar, M. S. (Dec 2018). Drought and Crop Nowcast and Forecast in NASA SERVIR Hubs. American Geophysical Union (AGU) Fall Meeting, Washington D.C., USA.

Skills List

Ecological Assessment	Analytical Data	Data Analyses and Collection
Microsoft Suite products	Cross-functional Collaboration	Interpersonal Communication
People Management	Data Visualization	Organization & Leadership Skills
Power BI, Minitab, Adobe Illustrator	Database Management- PostgreSQL	Programming & Coding Skills
Presentation Skills	Experimental Trials	Project Management
Python, MATLAB, C/C++	High-performance Computing	Remote Sensing
Research and Development	Technical Reporting	Team Leadership
Stakeholder Engagement		
Statistical Data Analysis		

Affiliations & Hobbies

- Biking, Soccer, Hiking, Traveling, Cooking, Volunteering for community gardening
- Outstanding Graduate Student Award in Agriculture and Water Resources Engineering; Best Poster Award for Outstanding Research, Engineering Research Symposium, MSU
- Technical Certification: Uni. of Michigan/Coursera Python Certification; Esri Technical Certification in ArcGIS
- Certified Crop Advisor | FAA Certified Remote Pilot