KUSHAL ADHIKARI

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EDUCATION

TEXAS TECH UNIVERSITY, LUBBOCK, TX, USA

Ph.D. in Civil Engineering *2021*
Dissertation Title: Design of an alternative wastewater treatment system for agricultural reuse
Committee Chair: Professor Clifford Fedler

Master of Science in Civil Engineering *2018*
Advisor: Professor Clifford Fedler
GPA: 4.00/4.00

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BENGALURU, INDIA

Bachelors in Civil Engineering *2014*
GPA: 3.84/4.00, Rank: 3/326

RESEARCH

MAJOR RESEARCH PROJECTS

Design of Pond-In-Pond (PIP) System for Wastewater Reuse and Reclamation
Developed a novel concept for wastewater reclamation that offered 40-60% reduction in area and almost 100% savings in energy cost as compared to existing wastewater treatment systems
Collected performance data and performed statistical analysis and data visualization using R - observed effluent values within the desired standards in all cases
Develop a mechanistic model to evaluate the configuration for PIP (In progress)

Sustaining Agriculture through Adaptive Management to Preserve the Ogallala Aquifer under a Changing Climate
Developed watershed model for Double Mountain Fork (DMF) watershed and performed model simulations to quantify the effects of climate change impacts on water yield and crop productivity
Performed feasibility study of dryland cotton production in South Plains of Texas – early planting based on heat units observed to give higher yield under future climate

Optimal Wells Location for Wolfforth City Water Project, TX, USA
Gathered data and developed an optimization model using R to determine the optimal well pattern for new wells subject to energy, cost, and quality constraints
Presented a detailed report to the city manager with results and GIS maps for all the five scenarios

Spatial Modeling and Analysis of Groundwater Levels for Edwards-Trinity Aquifer
Applied kriging technique in residuals of the groundwater model
Developed potentiometric surface and maps with greater accuracy for water resource management

RESEARCH CONTINUED

Construction Risks and Project Management
Evaluated the applicability of risk management techniques during periods of pandemic such as COVID-19
Analyzed construction accidents data with suggestions for site safety

Material Sustainability using Nanotechnology
Performed experimental tests on production of sustainable construction material
Analyze and evaluate the applicability of new cement using Life Cycle Cost Analysis (In progress)

Use of Waste Plastic Bottles in Construction
Replaced ordinary bricks with waste plastic bottles filled with sand and debris from construction sites
Designed and built a sustainable, durable, aesthetically rich, and a real standing structure

OTHER INDEPENDENT PROJECTS

Performed hydraulic analysis of White River in Texas using SToRM and HEC-RAS
Assessed depth to water tables in wells in the Ogallala Aquifer underlying Texas region using ArcGIS
Analyzed the channel flow data, designed, and simulated the culvert performance using HEC-RAS
Examined streamflow characteristics under different climatic conditions using flow hydrograph
Modeled water infiltration in soil using Green-Ampt and HYDRUS- 1D
Optimized the well patterns for municipal wells to minimize costs using MODFLOW
Evaluated the relative influences of climate change and urbanization using HEC-HMS
Conducted a site suitability analysis to identify the best location for buffalo commons using ArcGIS
Executed cash flow projection and feasibility study of a construction project using Excel spreadsheet

RESEARCH INTERESTS

Water and wastewater reuse/recycling
Hydrologic and hydraulic modeling
Food-water-energy nexus
Sustainable water resource management
Sustainable materials

PUBLICATIONS AND PRESENTATIONS

PUBLISHED PAPERS

Adhikari, K., & Fedler, C. B. (2020), Pond-In-Pond: An alternative system for wastewater treatment for reuse. *Journal of Environmental Chemical Engineering* , 8(2), 103523, https://doi.org/10.1016/j.jece.2019.103523.

Adhikari, K., & Fedler, C. B. (2020), Water Sustainability using Pond-In-Pond wastewater treatment system: Case studies, *Journal of Water Process Engineering*, 36, 101281, https://doi.org/10.1016/j.jwpe.2020.101281.

Poudyal, L., **Adhikari, K**. & Won, M. (2021), Mechanical and durability properties of Portland Limestone Cement (PLC) incorporated with nano calcium carbonate (CaCO3), *Materials*, 14(4):905. https://doi.org/10.3390/ma14040905

Poudyal, L., & **Adhikari, K**. (Co-first author) (2021), Environmental sustainability in cement industry: An integrated approach for green and economical cement production, *Resources, Environment, and Sustainability*, https://doi.org/10.1016/j.resenv.2021.100024

PUBLICATIONS AND PRESENTATIONS CONTINUED

PAPERS UNDER REVIEW

Adhikari, K., Fedler, C. B. & Asadi, A., 2-D modeling to understand the design configuration and flow dynamics of Pond-In-Pond (PIP) wastewater treatment system for reuse.

Asadi, A. & **Adhikari, K**., Minimizing the errors in prediction of water levels using kriging technique in residuals of the groundwater model (MODFLOW).

Adhikari, K., Poudyal, L. & Shankar, V., A review on risk management in construction projects: Status quo and future directions.

Adhikari, K., Poudyal, L. & Shankar, V., Future of construction industry: COVID-19 and its implications on construction projects and risk management – A review.

Poudyal, L., **Adhikari, K**. & Won, M., Nano calcium carbonate (CaCO3) as a reliable, durable, and environment-friendly alternative to diminishing fly ash

CONFERENCE PRESENTATIONS

Adhikari, K. & Fedler, C. B. (2021, May), Configuration of Pond-In-Pond Wastewater Treatment System. To be presented at *2021 World Environmental & Water Resources Congress (ASCE-EWRI)*, Milwaukee, WI.

Asadi, A. & **Adhikari, K**. (Co-presenter) (2021, May), Application of kriging technique in residuals of the groundwater model (MODFLOW) within the Edwards-Trinity aquifer. To be presented at *2021 World Environmental & Water Resources Congress (ASCE-EWRI)*, Milwaukee, WI.

Adhikari, K. & Fedler, C. B. (2020, Dec), Pond-In-Pond: An alternative treatment system for creating resiliency and sustainability in water supply through reuse and reclamation. Presented at *American Society of Nepalese Engineers (ASNEngr) 13th Annual Conference 2020*.

Adhikari, K. & Asadi, A. (2020, Dec), Minimizing the errors in prediction of water levels using kriging technique in residuals of the groundwater model (MODFLOW). Presented at *American Society of Nepalese Engineers (ASNEngr) 13th Annual Conference 2020*.

Adhikari, K. & Fedler, C. B. (2020, October), Water Sustainability Using Pond-In-Pond Wastewater Treatment System. Presented at *2020 SACNAS Virtual Conference*.

Adhikari, K. & Fedler, C. B. (2020, June), Pond-In-Pond Configuration for Wastewater Reuse: Sustainable Wastewater Treatment System. *AWWA 2020 Annual Conference and Exposition (ACE20)*, Orlando, FL[1].

Adhikari, K. & Fedler, C. B. (2020, May), An Alternative System for Wastewater Treatment: Pond-In-Pond – Case Studies. *2020 World Environmental & Water Resources Congress (ASCE-EWRI)*, Henderson, NV [1].

Adhikari, K. & Fedler, C. B. (2019, August), Pond-In-Pond: An Alternative System for Wastewater Treatment for Reuse. Poster presented at the *NSF Workshop: Networking for Environmental Sustainability in Arid Region Urban Communities*, Lubbock, TX.

Adhikari, K. & Uddameri V. (2018, August), Modeling Sustainable Adaptation Strategies towards a Climate-Smart-Agriculture in the Southern High Plains of Texas, USA. Paper presented at the *International ARID-LANDS Conference*, Lubbock, TX.

[1]Cancelled due to COVID-19 pandemic

PUBLICATIONS AND PRESENTATIONS CONTINUED

OTHER UNPUBLISHED REPORTS AND PRESENTATIONS

Adhikari, K., (2019). Land Application System and Fate of Phosphorous.

Singaraju, S. G., **Adhikari, K**., Karim, A., & Uddameri V. (2017). Groundwater Database for Kansas, New Mexico, Oklahoma and Texas.

Adhikari, K., (2017, November). Environmental Impact and Risk Assessment - Simulation of Contaminant Plume Migration in Sub-surface.

Adhikari, K., (2017, April). The Hazard Mitigation Plan for the City of Houston, Texas.

Adhikari, K., et al., (2016). Optimization of Existing Infrastructure for Municipal Wells.

Adhikari, K., (2016, December). Can Developing Nations Adapt Climate Change and Mitigate their Emissions? Case Study: Nepal.

Adhikari, K., et al. (2014), B. Towards Sustainability: Use of Waste Plastic Bottles in Construction.

TEACHING

TEXAS TECH UNIVERSITY, LUBBOCK, TX, USA

Grad Part-Time Instructor

Courses
Environmental Engineering Lab (Fall 2019 - Spring 2020)
Surveying Lab (Fall 2018 - Spring 2019)
Construction Materials Lab (Fall 2018)
Mechanics of Fluids Lab (Fall 2016 - Spring 2018)

Prepared and revised the syllabus, lab manuals and lectures as needed
Delivered lectures in class and led the laboratory with guidance and instructions to the students in conducting experiments and preparing lab reports
Designed and graded the assignments, weekly quizzes, and exams for the class
Provided undergraduates with hands on experience on sampling, surveying, testing methods, and qualitative and quantitative experimental analysis
Designed a dynamic and interactive Excel tool for automatic computation of the final grade distribution
Received consistently high evaluation scores far exceeding the university average

Graduate Teaching Assistant

Courses
Fluid Mechanics (Summer 2017, 2019, 2020)
Environmental Sustainability and Impact (Summer 2020)
Engineering Seminar (Spring 2019)
Groundwater Hydrology (Spring 2019)

Designed and graded the assignments and exams for a class of 40+ students in each course and held lectures in absence of faculty (5+ lectures held for graduate and courses)
Provided one-to-one mentorship to undergraduate students through regular office hours and appointment meetings
Converted most of the exam questions for Fluid Mechanics into FE exam format

TEACHING CONTINUED

Guest Lecturer

Course: *Surface Water Hydrology* (Graduate), Professor: Dr. Uddameri

Lecture on Evapotranspiration and Filtration, April 23, 2018
Workshop on use of HEC-HMS for hydrologic modeling, April 25, 2018
Workshop on Introduction to Soil and Water Assessment Tool (SWAT), April 30, 2018

Course: *Mechanics of Fluids* (Undergraduate), Professor: Dr. Fedler

Lecture on Basics of Fluid Flow: Types of Flow, Fluid System, Control Volume, Continuity Equation, September 17, 2019
Lecture on Steady, In-compressible Flow in Pressure Conduits (Laminar Flow), March 5, 2020
Lecture on Steady, In-compressible Flow in Pressure Conduits (Turbulent Flow), March 5, 2020

EVEREST COLLEGE, NEPAL

High School Teacher, (2014 - 2016)

Courses
High School Mathematics, *Fundamentals of Science*

Delivered lectures to over 40 students on a regular basis
Designed the syllabus, assignments and exams

SERVICES

DEPARTMENT, COLLEGE, UNIVERSITY SERVICE

Graduate Ambassador, Graduate School (2020 - 2021)
Assist the Texas Tech Graduate School with various functions including official events, campus tours, student panels, and recruitment and retention initiatives
Represent Texas Tech and the Graduate School at various committees – Dean's Student Leadership Council, Diversity Committee, Graduate Assembly and Professional Development Committee
Hold a high standard of integrity and professionalism as a representative of the Texas Tech University

Member, Library Student Advisory Board (2020 - 2021)
Attend board meetings and provide personal input on current and new library services, spaces, resources, events, and policies
Participate in user experience research projects to evaluate library services
Promote library services, resources, and events to fellow students

Mentor, Leadership and Mentorship Program (LAMP) (2019 - 2020)
Provide guidance and assist undergraduate students in their course
Collaborate with other graduate students for effective execution of LAMP

Community Office Chair, Tech Future Leaders in Transportation (TechFLT) (2019 - 2020)
Communicate with Student Government Association (SGA) representative and collaborate with officers from other organizations for joint events
Prepare and plan the community service opportunities

SERVICES CONTINUED

President, Nepalese Students Association (NSA) (2018 - 2019)
Led a team of eight other officers and volunteers in organizing and successfully executing 12+ events
Succeeded in bringing sponsors from, and outside, the university and offered an academic scholarship to a student
Increased organization funding by 50% and organizations internal funds by around 40%
Won the Worldwide Showcase, a cultural talent show, for the 1st time with popular votes

Graduate Student Representative, Texas Society of Professional Engineers (TSPE) (2018 - 2019)
Interacted with undergraduate students and helped them guide towards graduate degree
Advised and counseled undergraduates to assist them in making future decisions and career goals
Attended and participated in annual meetings and conferences held by NSPE and TSPE general meetings

Secretary, Nepalese Students Association (NSA) (2017 - 2018)
Handled correspondence, organized meetings, and logistical fulfilment for 10+ events with more than 100+ attendees

Other Services (2016 - 2020)
Judge - 11th Annual Undergraduate Research Conference, 17th Annual Graduate School Poster Competition, 9th Annual Arts & Humanities Research Conference
Student Volunteer - Arbor Day, Raiders Welcome Week, Diversity Week, Recycle Mania
University Campaigns - Promoted and supported the university led-campaigns - State Employee Charitable Campaign (SECC), Red Raider Return Fund project

COMMUNITY SERVICE

Student Volunteer - Lubbock 4th on Broadway, Tech to Town, Lubbock Lions - 67th Annual Pancake Festival, Texas
Volunteer - Catch the Engineering Bug, Society of Women Engineers
Volunteers Coordinator, Bagmati River Cleanliness Campaign, Nepal
Disaster Recovery Coordinator, Earthquake Immediate Relief Campaign, Nepal

PROFESSIONAL SERVICE

Reviewer (Journals)
Critical Reviews in Environmental Science and Technology (5)
Science of the Total Environment (35)
Journal of Environmental Chemical Engineering (28)
Journal of Water Process Engineering (18)
Sustainable Cities and Society (3)
Journal of Water Supply: Research and Technology - AQUA (3)
AQUA - Water Infrastructure, Ecosystems and Society (3)
Environmental Engineering and Management Journal (3)
Data in Brief (11)
International Journal of Construction Management (19)
ASCE - Journal of Construction Engineering and Management (8)
IWA World Water Congress & Exhibition 2020 (15)

PROFESSIONAL AFFILIATIONS, WORKSHOPS AND EXPERIENCES

PROFESSIONAL AFFILIATIONS

National Society of Professional Engineers (NSPE)
American Society of Civil Engineers (ASCE)
American Academy of Environmental Engineers & Scientists (AAEES)
American Water Works Association (AWWA)
National Center for Faculty Development and Diversity (NCFDD)
Engineers Without Borders (EWB)
Society of Environmental Professionals (SPE)
International Water Resources Association (IWRA)
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)

PROFESSIONAL DEVELOPMENT WORKSHOPS

Identifying Grants for Research and Project Funding, Texas Tech University
External Fellowship Workshop, Texas Tech University
Funding Institutional Trainings, Texas Tech University
Faculty Panel on Publication Workshop, Texas Tech University
How to Do a Literature Review, Texas Tech University
Best Practices in Library Research, Texas Tech University
Managing Your Research Data, Texas Tech University
Data Analytics Tools For Engineering Research, BrightTalk
Developing Productive Writing Practices, Texas Tech University
Publishing Your Research, Texas Tech University
Predatory Publishing, Texas Tech University
The Revision Process, Texas Tech University
Copyright and Fair Use, Texas Tech University
Building Rapport with Students, Texas Tech University
Encouraging Students to do the Readings, Texas Tech University
Promoting Diversity and Racial Equity in the Classroom, Texas Tech University
Creating Value in the Digital Classroom, Texas Tech University
Trust and excellence in peer review: How to become an effective peer reviewer, Cactus Communications
How technology can help fast-track the peer review process, Cactus Communications

PROFESSIONAL EXPERIENCE

Project Engineer/Coordinator, National Reconstruction Authority (NRA), Ministry of Urban Development, Nepal (2016)
Led a team of 15 engineering diplomas and technicians for successful accomplishment of reconstruction project – 150 individual homes, three community shelters and two schools in an earthquake affected area
Inspected and assessed the structural damage and developed design ideas and strategies
Provided training and workshops on earthquake resistant design techniques to local technical persons

Engineer, Water Supply and Sanitation Project, Building Design Authority, Nepal (2015)
Collaborated in design of water treatment system, prepared reports and made presentations to the clients
Determined the pump requirements and specifications for three-stage lift system carrying water to a height of 600+ meters and designed flow network to serve a community of 900+ households

HONORS, AWARDS, GRANTS & FELLOWSHIPS

Doctoral Dissertation Completion Fellowship, Texas Tech University (2020 - 2021)
Nominated by the faculty adviser and endorsed by the department chair

Presidential Doctoral TA/GPTI Scholarship, Texas Tech University (2018 - Present)

Excellent Reviewer on Publons (2020)
Based on feedback provided by the journal editors on review of manuscripts

Registration Scholarship for 2020 SACNAS - The National Diversity in STEM Virtual Conference (2020)

John B. Hawley Memorial Fellowship, American Society of Civil Engineers (ASCE) (2019 - 2020)
Awarded to one graduate student from all universities across Texas

Helen DeVitt Jones Graduate Fellowship, Texas Tech University (2018 - 2020)
Merit-based fellowship typically awarded to one graduate engineering student each year

Whitacre College of Engineering Scholarship, Texas Tech University (2018)

Best New Employee Award, Building Design Authority (BDA), Nepal (2015)

Innovative Project of the Year, Visvesvaraya Technological University, India (2014)
Awarded for senior year project - Use of waste plastic bottles in construction

Golden Jubilee Academic Fellowship, Government of India (2010 - 2014)
One of the sixty students from Nepal receiving undergraduate scholarship (awarded by Indian Embassy, Nepal)

LICENSE AND CERTIFICATIONS

Registered Engineer License, Nepal Engineering Council, Government of Nepal

The Groundwork Program: Teaching Training for Graduate Students, TLDPC, Texas Tech University

Research Strategies Training Program, Graduate School, Texas Tech University

LANGUAGES

Proficiency in English, Nepali and Hindi

WEBSITES

Many of the papers and presentations referenced above and additional information is located at:

My Personal Website: https://www.adhikarikushal.com/

Other sources for additional information

Publons: https://publons.com/a/3155614
Orcid: https://orcid.org/0000-0002-2842-402X
ResearchGate: https://www.researchgate.net/profile/Kushal_Adhikari
LinkedIn: www.linkedin.com/in/adhikari-kushal