RUBAB SAHER
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EDUCATION

Ph.D.	University of Nevada, Las Vegas (UNLV), USA, **Department of Civil and Environmental and Construction Engineering** Dissertation: "Kaleidoscope of Urban Evapotranspiration: exploring the science and techniques" **Advisors:** Dr. Haroon Stephen and Dr. Sajjad Ahmad	**2018-2021**
MSc.	Mehran University of Engineering & Technology, Jamshoro, Sindh, **Hydraulics Irrigation & Drainage** Thesis: "Potential for Hydropower Generation in Sindh- Comparative Studies with Solar & Wind" **Advisors:** Ms. Hadiqa Maqsood and Mr. Muhammad Ali	**2015-2017**
BE.	Mehran University of Engineering & Technology, Jamshoro (MUET), Sindh, **Department of Civil Engineering**. Thesis: "Effect of Lime on Geotechnical Properties of Indus Basin Sediments" **Advisor:** Dr. Aneel Kumar	**2011-2015**

PROFESSIONAL APPOINTMENTS

1. Postdoc Research Associate I, The University of Arizona, Tucson	2024-Present
2. Maki Postdoc Fellowship, Desert Research Institute, Las Vegas	2021-2023
3. Graduate Research Assistant, Department of Civil and Environmental Engineering, UNLV	2018-2021
4. Research Assistant, Australian Centre for International Agricultural Research, USPCAS-W, Mehran UET, Jamshoro. PK	2017-2018

GRANTS & FUNDINGS

1. Saher, Rubab "Understanding the gaps between irrigation water requirement and irrigation water application using remote sensing dataset" 300K project Maki Endowment as fellowship, Desert Research Institute, Las Vegas	2021-2023
2. Saher, Rubab "Exploring the science of urban climates using satellite data" 5K mentorship project funded by Desert Research Institute under Research Immersion Program.	2021-2023

AWARDS & FELLOWSHIPS

1. Visiting Scholar, Urban Climate Research Center, Arizona State University 08/2022
2. 2021 Clare Mahannah Memorial Scholarship, Nevada Water Resource Association 01/2021
3. Student of the Month, Nevada Water Resource Association 11/2020
4. Recipient of Top Tier Doctoral Research Fellowship, University of Nevada, Las Vegas 2018-2020
5. First rank for 2020 Poster Competition at Nevada Water Resource Association Conference 02/2020
6. Graduate Professional Student Association, UNLV, Travel Grant recipient, UNLV 06/2019
7. Nominee in Fulbright Doctoral Scholarship (declined) 2017
8. Exchange Student at University of Utah, USA 08/2016-12/2016
9. Outstanding budding researcher award, USPCASW 2017
10. Post-Graduation at United States Pakistan Center for Advanced Studies in Water, MUET, Jamshoro funded by USAID 2015-2017
11. Third Rank in Undergraduate program, Mehran UET 2011-2015

PUBLICATIONS

Journal Publications (7 published, one under review)

1. **Saher, R.,** Ott, T. (2023). To Water or Not to Water: Assessing the Irrigation Water Rates at a House Scale in Arid City. *Final round of revision to Journal of Irrigation Water Management, Elsevier (round 2 reviews)*
2. **Saher, R.,** Stephen, H., & Ahmad, S. (2023). Role of Urban Landscapes in Changing the Irrigation Water Requirements in Arid Climate. *Geosciences, 13*(1).
3. **Saher, R.,** Middel, A., Stephen, H., & Ahmad, S. (2022). Assessing the Microclimate Effects and Irrigation Water Requirements of Mesic, Oasis, and Xeric Landscapes. *Hydrology*, *9*(6), 104.
4. **Saher, R.,** Stephen, H., & Ahmad, S. (2021). Understanding the summertime warming in canyon and non-canyon surfaces. *Urban Climate*, 38, 100916.

5. **Saher, R.,** Stephen, H., & Ahmad, S. (2021). Effect of land use change on summertime surface temperature, albedo, and evapotranspiration in Las Vegas Valley. *Urban Climate*, 39, 100966.

6. **Saher, R.,** Stephen, H., & Ahmad, S. (2020). Urban evapotranspiration of green spaces in arid regions through two established approaches: a review of key drivers, advancements, limitations, and potential opportunities. *Urban Water Journal*, 1-13.

7. Zaman, H., **Saher, R**., Imad, U., Rind, M., (2017). "Effect of Urban Sprawl on Temperature-Case Study of Karachi", *International Journal of emerging technology and advanced engineering,* 7(4), 1-16.

8. **Saher, R.,** Ghanghro, S., Lohana, S., Jamil, I., Kumar, A. 2017. "Lime Stabilization on Indus River- Aiming to explore geotechnical properties", *International Journal of emerging trends in engineering and development,* 3(7), 175-182.

Conference Proceedings (10 published)
International

1. **Saher, R.,** Arteaga, C., Stephen, H., Park JW. The role of Prior Knowledge in the Performance of Engineering Students. 2021 ASEE Annual Conference & Exposition, Long Beach, California (June 27-30, 2021)

2. **Saher, R**., Stephen, H., & Ahmad, S. (2020, May). Effect of Building Shade on Evapotranspiration in Las Vegas Valley. In *World Environmental and Water Resources Congress 2020: Water Resources Planning and Management and Irrigation and Drainage* (pp. 57-65). Reston, VA: American Society of Civil Engineers.

3. **Saher, R.,** Ali Shaikh, T., Ahmad, S., & Stephen, H. (2020). Analysis of Changes in Runoff Due to Land Cover Change. In *Watershed Management 2020* (pp. 245-256). Reston, VA: American Society of Civil Engineers.

4. Ali Shaikh, T., **Saher, R.,** Ahmad, S., Gerrity, D., & Stephen, H. (2020). Impacts of Urban Development on Flooding: A Case Study of Flamingo and Tropicana Watershed, Clark County. In *Watershed Management 2020* (pp. 233-244). Reston, VA: American Society of Civil Engineers.

5. **Saher, R.,** Rind, M. A., Stephen, H., Ahmad, S., & Rind, U. A. (2020, May). Analysis of the Effects of Retrofitting Low Impact Developments on Urban Runoff and Pollutant Load. In *World Environmental and Water Resources Congress 2020: Water, Wastewater, and Stormwater and Water Desalination and Reuse* (pp. 178-190). Reston, VA: American Society of Civil Engineers.

6. **Saher, R.,** Ahmad, S., & Stephen, H. (2019, May). Analysis of Changes in Surface Energy Fluxes Due to Urbanization in Las Vegas. In *World Environmental and Water Resources Congress 2019: Groundwater, Sustainability, Hydro-Climate/Climate Change, and*

Environmental Engineering (pp. 175-186). Reston, VA: American Society of Civil Engineers.

7. Siyal, A. A., Bhatti, A. M., Babar, M. M., Ansari, K., **Saher, R.,** & Ahmed, S. (2019, May). Environmental Impact of Conversion of Natural Wetland into Reservoir: A Case Study of Chotiari Reservoir in Pakistan. In *World Environmental and Water Resources Congress 2019: Watershed Management, Irrigation and Drainage, and Water Resources Planning and Management* (pp. 15-27). Reston, VA: American Society of Civil Engineers.

8. Rind, M. A., Ansari, K., **Saher, R.,** Shakya, S., & Ahmad, S. (2018, May). 2D Hydrodynamic Model for Flood Vulnerability Assessment of Lower Indus River Basin, Pakistan. In *World Environmental and Water Resources Congress 2018: Watershed Management, Irrigation and Drainage, and Water Resources Planning and Management* (pp. 468-482). Reston, VA: American Society of Civil Engineers.

9. **Saher, R.,** Rind, M. A., Devnani, R., (2017). "Required Friction Vulnerability Analysis of Indus Highway (N-55), Sindh, Pakistan", *International Conference on Sustainable Development in Civil Engineering, MUET, Pakistan.*

National

10. **Saher, R.,** Maqsood, H., Ali, M., Ghanghro, S., "Potential for Hydropower Generation in Sindh- A Case Study of Lower Nara Canal & RD 26", (2017). *1st National Young Researcher's Conference on Water and Environment, USPCAS-W,Mehran UET, Jamshoro, Sindh*.

CONFERENCE PRESENTATIONS

International

1. **Saher, R.,** Condon, L., Mo, H., (2024) Can High-Resolution Mapping Reveal U.S. Groundwater-Dependent Ecosystems? In American Geophysical Union (AGU) Fall Meeting, December 2024 (Submitted Abstract)

2. Mo, H., **Saher, R.,** Tadych, D., Condon, L., Optimal Spatial Resolution for Greenness Monitoring Using Remote Sensing: A Case Study of the San Pedro River. In American Geophysical Union (AGU) Fall Meeting, December 2024 (Submitted Abstract)

3. **Saher, R.,** Condon L.,(2024): High Resolution Groundwater Dependent Ecosystems across the United States, Computational Methods in Water Resources (CMWR), University of Arizona, Tucson, AZ (Scheduled to Present in September, 2024)

4. Mejía Valencia, J. F., Henao, J., and **Saher, R**.(2023): The effect of removal of all non-functional turf in Las Vegas: tradeoffs between water conservation, excessive heat, and storminess, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023.

5. Mejia, J., Henao, J. J., Eslami, E., & **Saher, R.** (2023). The impacts of cooling adaptation and mitigation strategies on the heat index and clouds. In AGU Fall Meeting 2023. AGU.

6. Mejia J., Henoa, J., Eslami, E., & **Saher, R.,** (2023). The impacts of cooling adaptation and mitigation strategies on heat index and clouds. In AGU Fall Meeting 2023. AGU.

7. Valencia, J. F. M., Henao, J., & **Saher, R.** (2023). The effect of removal of all non-functional turf in Las Vegas: tradeoffs between water conservation, excessive heat, and storminess (No. EGU23-17481). Copernicus Meetings.

8. **Saher, R.** (2023) Faults in Our Irrigation Pattern: A Case Study of Las Vegas Valley. World Environmental and Water Resources Congress 2023, Henderson, Nevada. (Abstract Accepted)

9. **Saher, R**., Middel, A. (2023) Can Unmanned Aerial Vehicles be the way forward for Urban Hydrology. Environmental and Water Resources Congress 2023, Henderson, Nevada. (Abstract Accepted)

10. **Saher, R.,** Mejia, J., (2021, December). Efficacy of White Roofs on Urban Outdoor Thermal Comfort. In AGU Fall Meeting 2021. AGU.

11. **Saher, R.,** Middel, A., Ahmad, S., & Stephen, H. (2021, December). Numerical Approach to Understanding the Microclimate Effects and Irrigation Water Requirements in Urban Landscapes. In AGU Fall Meeting 2021. AGU.

12. **Saher, R.**, Rind, M.A., Devnani, R., (2017)." Required Friction Vulnerability Analysis of Indus Highway (N-55), Sindh". *International Conference on Sustainable Development, Mehran UET, Jamshoro, Pakistan.*

13. Rind M.A., **Saher R**, Ansari K., Ahmad S., (2018). "2D Flood Vulnerability Analysis of Lower Indus River, Sindh: Past & Future". *World Environmental and Water Resources Congress 2018,* Minneapolis, MN, USA.

14. **Saher, R.,** Ahmad, S., & Stephen, H. (2019). "Analysis of Changes in Surface Energy Fluxes Due to Urbanization in Las Vegas". *World Environmental and Water Resources Congress 2019, Pittsburgh, PA, USA.*

15. Siyal, A. A., Bhatti, A. M., Babar, M. M., Ansari, K., **Saher, R.,** & Ahmed, S. (2019). "Environmental Impact of Conversion of Natural Wetland into Reservoir: A Case Study of Chotiari Reservoir in Pakistan". *World Environmental and Water Resources Congress 2019, Pittsburgh, PA, USA.*

16. **Saher, R.**, Middel, A., Ahmad, S., Stephen, H., "Numerical Approach to Understanding the Microclimate Effects and Irrigation Water Requirements in Urban Landscapes", *AGU Fall Meeting, 2021, New Orleans, LA.*

17. **Saher, R.**, Mejia J, "Efficacy of White Roof on Outdoor Thermal Comforts", *AGU Fall Meeting, 2021, New Orleans, LA.*

National

1. **Saher, R.,** Stephen, H., & Ahmad, S. (2020). "Exploring the Science of Urban Evapotranspiration: Bibliographical Analysis". *2020 Nevada Water Resource Association (NWRA) Annual Conference, Las Vegas, NV, USA.*

2. **Saher R.,** Dhanji M. Rind M., Aly U., (2017). "Rainfall-Runoff Harvesting of Karoonjhar Mountains- Tharparkar, Sindh". *2017 Watershed Symposium Salt Lake City, UT, USA.*

Local

1. **Saher, R.,** Maqsood, H., Ali, M., Ghanghro, S., (2017)." Potential for Hydropower Generation in Sindh-A Case Study of Lower Nara Canal & RD 26". *1st National Young Researchr's Conference on Water and Environment, United States Pakistan Center for Advanced Studies in Water, Mehran UET, Jamshoro, Pakistan.*

2. **Saher, R.,** Ahmad, S., & Stephen, H. (2018). "Evapotranspiration of Las Vegas". *8th Graduate Celebration, College of engineering UNLV, NV, USA.*

3. **Saher, R.,** Ahmad, S., & Stephen, H. (2018)." Study of Outdoor Water Demand using Hydrological Modelling and Remote Sensing". *Southern Nevada Water Authority (SNWA) Team, UNLV, NV, USA.*

4. **Saher, R.,** Ahmad, S., & Stephen, H. (2019). "Role of Urbanization in Changing Surface Energy Fluxes". *9th Graduate Celebration, College of engineering UNLV, NV, USA.*

5. **Saher, R.,** Stephen, H., & Ahmad, S. (2020). "Analyzing the Effects of Land Use Change on Surface Temperature and Albedo in Las Vegas Valley". Student Research Forum, Graduate and Professional Student Association, UNLV, NV, USA.

PROFESSIONAL SERVICES

- Review Editor for Water and Hydro complexity, Frontiers in Water, (IF=2.9)
- Reviewer for NSF EPSCoR Summer 2022 Undergraduate Research Opportunity Program
- Reviewer for Water Resources Research Journal (IF=6.16), Journal of Hydrology (IF=6.4), Urban Climate Journal (IF=6.663), Remote Sensing Journal by MDPI (IF= 4.84), Atmosphere by MDPI (IF=3.11), Journal of American Water Resources Association (IF=2.69), Remote Sensing Journal by MDPI (IF= 4.84), Urban Water Journal (IF=2.8)
- Member of Denver Urban Field Stations, United States Forest Services
- Member of American Geophysical Union (AGU) (since 2021)
- Student Member of American Society of Civil Engineers (ASCE) (since 2019)
- Member at Nevada STEM Mentor Network (since 2021)
- Mentor at Women Water Nexus, ASCE (since 2019)
- Student Member Board of Directors, Nevada Water Resource Association (NWRA) (since 2018)
- Registered Engineer with Pakistan Engineering Council (since 2015)

TEACHING & MENTORSHIP EXPERIENCE

- Mentor for Research Immersion Internship funded by Desert Research Institute (Fall, 2022)

- Mentor at Nevada STEM Mentor Network (since 2022)
- Designed a course curriculum of Elementary Surveying (CEE 121) & Structural Engineering (CEE 381) for Department of Civil and Environmental Engineering and Construction at University of Nevada, Las Vegas (08/2021)
- Organizer of 1st National Conference on Water and Environment, USPCAS-W, Mehran UET. Pakistan, 2017
- Member of reviewing panel at International Conference on Sustainable Development in Civil Engineering (ICSDS), Karachi, 2017

SELECTED MEDIA COMMUNICATIONS & INVITED TALKS

- Interview with Outside/In
  https://outsideinradio.org/shows/its-not-easy-being-evergreen

- Interview with New Hampshire Public Radio
  http://outsideinradio.org/shows/its-not-easy-being-evergreen

- Interview with Salt Lake Tribune
  https://www.sltrib.com/news/2022/11/16/how-using-an-oasis-models-can/

- Interview with Fox 13/ Salt Lake Tribune/Utah Public Radio
  https://www.upr.org/utah-news/2022-11-16/you-can-still-have-an-oasis-in-the-desert

- Interview with 8newsnow
  https://www.8newsnow.com/news/local-news/oasis-strategy-landscaping-that-cools-and-saves-water-dri-study-shows/

- Interview with Wired Magazine
  https://www.wired.com/story/lawns-are-dumb-but-ripping-them-out-may-come-with-a-catch/

- Interview with Nevada Current
  https://www.nevadacurrent.com/2022/09/19/removing-grass-may-increase-urban-heat-study-finds/

- Interview with Colorado Sun
  https://coloradosun.com/2022/09/22/drought-water-landscaping-colorado-xeriscape-oasis/

- Phys.org
  https://phys.org/news/2022-09-turf-grass-urban.html

- Interview with Las Vegas Review-Journal
  https://www.reviewjournal.com/local/weather/dri-study-shows-plants-can-help-combat-rising-temps-2640535/

- Interview with Desert Research Institute (DRI), Las Vegas

https://www.dri.edu/new-study-examines-impacts-of-three-desert-landscaping-strategies-on-urban-irrigation-and-air-temperatures/

- Interview with Nevada Water Resources Research Institute (NWRRI) (Page 7) chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fs3-us-west-2.amazonaws.com%2Fwebfiles.dri.edu%2FNWRRI%2F%2520Newsletters%2FNWRRI%2520Fall%25202021%2520Newsletter.pdf&clen=4042577&chunk=true

- Interview with USAID Pakistan https://www.facebook.com/USAIDPakistan/posts/mypakistan-i-grew-up-in-a-small-town-of-matiari-in-sindh-province-since-childhoo/1911666805520858/

- Student Spotlight, Nevada Water Resource Association http://www.nvwra.org/student-of-the-month

- Masters Research Interview https://tribune.com.pk/story/1417221/high-presence-antibiotic-resistant-bacterium-detected-water

MODELING AND COMPUTER SKILLS

Geospatial & Climate Analysis Tools

ArcGIS (including Hydrodesktop) & ENVI	Expert (Comfortable in performing variety of analysis including watershed delineation, spatial analysis, thematic map generation, LAS dataset analysis)
Adobe Geographic Imager	Proficient (familiar with the interface, color correction of remote sensing dataset, and basic analysis)
Google Earth Engine (API)	Proficient (familiar with the interface, can write simple codes for remote sensing analysis/ have processed Sentinel and PlanetFusion dataset to estimate evapotranspiration)
Weather Research Forecast (WRF) Model	Novice (familiar with interface, can run a base model and read/interpret the outputs/ have helped improve the code for soil moisture balance)
QGIS (SUEWS, LASTools,)	Expert (developed different terrain/vegetated models, estimation of radiation and Sky View Factor)
GRASS	Proficient (aware of the interface, can do simple spatial analysis)

ERDAS Imagine	Proficient (aware of the interface, can do image, correction analysis and interpolation)
SAGA GIS	Proficient (comfortable with the interface and basic spatial analysis)
Cloud Compare	Proficient (familiar with the interface, fluent with LiDAR data processing)
ENVI-met	Expert (familiar with the interface, can digitize, simulate, and perform advanced analysis using Leonardo)

Programming Tools

MATLAB	Expert (image processing including ROI analysis, clipping, and extraction of matrix data points, SEB algorithms, statistical analysis; can generate spatial maps using remote sensing dataset)
Python	Novice (familiar with the interface and language, can write a basic script, can read complex scripts)
C ++	Novice (familiar with the interface and language, can write a basic script, can read complex scripts)

Statistical Tools

R package	Proficient (familiar with the interface, scriptwriting, and comfortable with various libraries for statistical analysis)
SPSS	Proficient (familiar with the interface, and comfortable with performing various statistical analysis)
MiniTAB	Novice (familiar with interface, scriptwriting, qqlot and ggplot generation)

Hydrological Tools

SWMM & PCSWMM	Proficient (familiar with the interface, can design and analyze the water distribution system with different scenarios)
HECRAS	Proficient (familiar with the interface, can design and analyze different hydraulic structures)
WATERCAD	Proficient
HECHMS	Proficient (familiar with the interface, comfortable with rainfall runoff analysis using different land cover change scenarios)
WEAP	Proficient (familiar with the interface, comfortable with various analysis)

SIRMOD	Novice (familiar with the interface and basic applications)
MODFLOW	Novice (familiar with the interface and basic applications)
EPANET & EPANET 2	Novice (familiar with the interface and basic applications)
	Resource Management Tools
STELLA	Proficient (familiar with the interface; fluent in building the model and running different scenarios)
LINGO	Proficient (can develop and run different optimization model; fluent with the development of nonlinear objective function and constraints)
LINDO	Proficient (can develop and run different optimization model; fluent with the development of nonlinear objective function and constraints)
RETScreen	Proficient (familiar with interface, fluent in comparing different renewable energy scenarios under different scenarios to understand the technical feasibility)
	Engineering Tools
Extended 3D Analysis of Building Systems (ETABS)	Proficient (familiar with the interface and fluent in building structural analysis)
AutoCAD (Computer Aided Design)	Proficient (familiar with the interface and fluent in developing both 2 and 3 dimensional plans and cross sections)

REFERENCES AVAILABLE UPON REQUEST

Laura Lotter
The University of Arizona

Sean Mckenna
Desert Research Institute

Ariane Middel
Arizona State University

Haroon Stephen
University of Nevada, Las Vegas

Sajjad Ahmad
University of Nevada Las Vegas