

# **Abid Sarwar, Ph.D.**

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## **Education**

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**Ph.D. Biological & Agri. Engineering (CGPA=3.81) 2016-2019**

Major: Land, Air, Water Resources, and Environmental Engineering

Dissertation title:

Experimental and modeling techniques for accurate measurement of wind drift and evaporation losses to improve water application efficiency of moving sprinkler irrigation systems in Washington, **Washington State University, USA** (R. Troy Peters - Chair, Claudio O. Stockle, Jennifer C. Adam)

**M.Sc. (Hons.) Agricultural Engineering (CGPA=3.76) 2011-2013**

Major: Irrigation and Drainage

Thesis title:

Climate Change Sensitivity Analysis of Upper Indus Basin Stream Flows and their Impact on the Downstream Water Resources, using SWAT Model, **University of Agriculture Faisalabad**, Pakistan (M.J.M Cheema-Chair, Allah Bakhsh, Aftab Wajid)

**B.Sc. Agricultural Engineering, UAF-PK (CGPA=3.51) 2007-2011**

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## **Teaching /Research Experience**

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**Lecturer, Sep 2014 - to date**

University of Agriculture, Faisalabad, Pakistan

Department of Irrigation and Drainage, Faculty of Agricultural Engineering and Technology

**Research Assistant, Sep 2016 – Dec 2019**

Biological Systems Engineering, Washington State University, USA (Supervisor: Prof. Dr. R. Troy Peters)

**Assistant Executive Engineer, Sep 2013-Sep 2014**

University of Agriculture, Faisalabad, Pakistan

Department of Irrigation and Drainage, Faculty of Agricultural Engineering and Technology

**Research Fellow Aug 2011-Sep 2012**

Project entitled "On Farm R&D Component for the Rehabilitation of Lower Chenab Canal Part-B" funded by JICA

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## **Peer Reviewed Publications**

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1. **Sarwar, A.**, Peters, R. T., Mohamed, A. Z., Shafeeque, M., and Ullah I. (2021). Accurate measurement of wind drift and evaporation losses could improve water application efficiency of sprinkler irrigation systems - a comparison of measuring techniques. **Agricultural Water Management, [under review: AGWAT-D-20-00003R1]**
2. Saddique, N; Muzammil, M; Jahangir, I; Ahmed, E; **Sarwar, A**; Bernhofer, C. (2021). Hydrological Evaluation of eighteen Satellite-Based, Gauge-Based and Reanalysis Precipitation Products in a Data Scarce Mountainous Catchment. **Hydrological Sciences Journal [under review: HSJ-2021-0103.R1]**
3. Khan, M.U.; Ahmad, M.; Sultan, M.; Sohoo, I.; Ghimire, P.C.; Zahid, A.; **Sarwar, A.**; Farooq, M.; Sajjad, U.; Abdeshahian, P.; Yousaf, M. Biogas Production Potential from

- Livestock Manure in Pakistan. **Sustainability** 2021, **13**, 6751.  
<https://doi.org/10.3390/su13126751>
4. A.Z. Mohamed, R.T. Peters, **A. Sarwar**, Behnaz Molaei, & Don McMoran (2021). Impact of the intermittency movement of center pivots on irrigation uniformity. **Water**, **13** (9), 1167.
  5. Ikram Ullah, Mao Hanping, Ghulam Rasool, Gao Hongyan, Qaiser Javed, **Abid Sarwar**, Muhammad Imran Khan (2021). Effect of Deficit Irrigation and Reduced N Fertilization on Plant Growth, Root Morphology and Water Use Efficiency of Tomato Grown in Soilless Culture. **Agronomy**, **11**(2), 228.
  6. Muhammad Shafeeque, Arfan Arshad, Ahmed Elbaltagi, **Abid Sarwar**, Quoc Bao Pham, Shahbaz Nasir Khan, and Adil Dilawar (2021). Understanding temporary reduction in atmospheric pollution and its impacts on coastal aquatic system during COVID-19 lockdown: A case study of South Asia. **Geomatics, Natural Hazards and Risk**, **12**(1), 560-580.
  7. Behnaz Molaei, R. Troy Peters, Abdelmoneim Z Mohamed, **Abid Sarwar** (2021). Large Scale Evaluation of a LEPA/LESA system compared to MESA on Spearmint and Peppermint. **Industrial Crops and Products**. **159**, 113048.
  8. Rasool, A., M. Said., M. Shafeeque., I. Ahmed., H. A. EL-Serehy., S. Ali., B. Murtaza., & **A. Sarwar**. (2020) Evaluation of Arsenic contamination and potential health risk through water intake in urban and rural areas. **Human and Ecological Risk Assessment: An International Journal**, 1-16.
  9. Aloqaili, F., Good, S., Finkenbiner, C., **Sarwar, A.** (2020). Using stable water isotopes to assess the influence of irrigation structural configurations on evaporation losses in semiarid agricultural systems. **Agricultural and Forest Meteorology**, 108083.
  10. **Sarwar, A.**, Peters, R. T., & Mohamed, A. Z. (2020). Linear mixed modeling and artificial neural network techniques for predicting wind drift and evaporation losses under moving sprinkler irrigation systems. **Irrigation Science**, 1-12.
  11. **Sarwar, A.**, Peters, R.T., Mehanna, H., Amini, M.Z., Mohamed, A.Z. (2019). Evaluating water application efficiency of low and mid elevation spray application under changing weather conditions. **Agricultural Water Management**, **221**, 84-91.
  12. A.Z. Mohamed, R.T. Peters, & **A. Sarwar**. (2019). Adjusting irrigation uniformity coefficients for unimportant variability on a small scale. **Agricultural Water Management**, **213**, 1078-1083.
  13. Qamar, M. U., Azmat, M., Shahid, M. A., Ganora, D., Ahmad, S., Cheema, M. J. M., Fiaz, M.A., **Sarwar, A.**, Shafeeque, M., and Khan, M. I. (2017). Rainfall extremes: a novel modeling approach for regionalization. **Water resources management**, **31**(6), 1975-1994.
  14. Shafeeque M., M.J.M Cheema and **A. Sarwar**. 2015. Quantification of Groundwater Abstraction using SWAT Model in Hakra Branch Canal System of Pakistan. **Pakistan Journal of Agricultural Sciences**. **Pak. J. Agri. Sci.**, Vol. **53**(1): 249-255.

1. **Sarwar, A.**, Peters, T. R., & Mohamed, A. (2019). Evaluation of twelve wind drift and evaporation loss (WDEL) empirical models through field experimentation under the climatic conditions of Prosser, Washington. In 2019 ASABE Annual International Meeting (p. 1). American Society of Agricultural and Biological Engineers.
2. Shafeeque, M., Yi, L., Cheema, M. J. M., **Sarwar, A.**, & Asim, M. I. (2019). Assessing the Suitability of Gridded Precipitation Datasets for Hydrological Modeling Studies in Upper Indus Basin. American Water Resources Association and Center for Water Resources Research, CAS presented at the 2019 International Specialty Conference Water Security: New Technologies, Strategies, Policies, and Institutions, 16-18 September, Beijing China.
3. R. T. Peters, B. Molaei, **A. Sarwar**, & A. Z. Mohamed. (2019) Large Scale evaluation of a low energy precision application system compared to mid elevation spray application on spearmint and peppermint, In 2019 ASABE Annual International Meeting, Boston, Massachusetts, USA.
4. **Sarwar, A.**, Peters, R.T., Mehanna, H., Amini, M.Z., Mohamed, A.Z. (2019). A Comprehensive Evaluation of Moving Sprinkler Irrigation Systems (MESA and LESA) under Dynamic Variations of Weather Conditions. Poster presentation, GPSA Research Exposition, March 28, CUB Ballroom Washington State University, WA.
5. **Sarwar, A.**, Peters, R.T., Mehanna, H., Amini, M.Z., Mohamed, A.Z. Molaei, B. (2018). Low elevation and Mid elevation spray application (LESA & MESA) trials under dynamic variations of weather conditions. Poster presentation. PGSA Research Expo, October 19. IAREC Prosser, WA.
6. R. T. Peters, H. Neibling, R. Stroh, **A. Sarwar**, B. Molaei, & A. Z. Mohamed. (2018). Low Elevation Spray Application (LESA) compared with Mid Elevation Spray Application (MESA) on Center Pivots in the Pacific Northwest. In 2018 ASABE Annual International Meeting, Detroit USA.
7. R. T. Peters, **A. Sarwar**, M. Hani, M.Z. Amini, & A. Z. Mohamed. (2018). Center Pivot Irrigation Efficiency as a Function of Weather and Sprinkler Height. In 2018 Irrigation Association Education Conference, Long Beach, California.
8. A.Z. Mohamed, R.T. Peters, **A. Sarwar**, & D. Mc Moran. (2018). The Accuracy of Distribution Uniformity Test under Different Moving Irrigation Systems. In 2018 ASABE Annual International Meeting, Detroit USA.
9. **Sarwar, A.**, khot, L.R., and Peters, T.R. (2017). Applicability of low altitude multispectral sensing towards crop and site-specific adaptation of LESA. Paper presented at "Climate Impacts to water conference, January 25-26, Skamania Lodge, Stevenson, WA. USA.
10. **Sarwar, A.**, M. Shafeeque., K. Mehmood, M. I. Asim, S. Ali and U. Maqsood. 2015. Water and energy saving through real time optimization of surface irrigation

system. Abstract published in “Abstract Book: International Workshop on Renewable Energy Technologies for Community Development in Pakistan” held on November 04-06, 2015, pp. 44 (ISBN 978-969-9035-11-1).

11. Ali, S., Z. M. Khan., A. Nasir., **A. Sarwar.**, K. Mehmood., R. A. Aslam S. N. Khan., M.M. Waqas. 2015. Satellite based estimation of spatially distributed solar irradiation in Pakistan. Abstract published in “Abstract Book: International Workshop on Renewable Energy Technologies for Community Development in Pakistan” held on November 04-06, 2015, pp. 83 (ISBN 978-969-9035-11-1).
12. **Sarwar, A.**, M.S. Nasir., A. Khaliq and M. Shafeeque. 2014. Assessment of water and energy productivity of maize crop under conservative farming. Abstract published in “Abstract Book: International workshop on Renewable energy technologies in Pakistan” held on December 16-18, 2014, organized by University of Agriculture, Faisalabad and University of Kassel, Germany, pp. 60 (ISBN 978-969-9035-01-04).

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## Book Chapter

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1. Khan, M. U., N. Dutta, **A. Sarwar**, M. Ahmad, M. Yousaf, Y. Kadmi, M. A. Shariati. (2021) Chapter 21, Microalgal-bacterial consortia for biomass production and wastewater treatment, In Handbook of Algal Biofuels: Aspects of Cultivation, Conversion and Biorefinery, Publisher Elsevier [**accepted**]
2. A.Z. Mohamed, R.T. Peters, **A. Sarwar**, and Molaei B. (2021). A Review of Low Energy, High Efficiency Alternatives for Center Pivot Irrigation Systems, Chapter In Handbook of Irrigation Hydrology and Management (HIHM-2020) Publisher Tylor & Francis, [**under review**]
3. Cheema, M.J.M., M. Jamal and **A. Sarwar**. (2017). Channel Design and Control Structures, Chapter no. 5 in the book Applied Irrigation Engineering, Editors: A. Bakhsh and M.R. Choudhry pages 95-119, Publisher UAF, Faisalabad, (ISBN 978-969-8237-97-4). <http://onlinebooks.uaf.edu.pk/Chapter.aspx?ChapId=75>

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## External Recognitions/Awards

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- **Irrigation E3 program winner** for Irrigation Association 2019 Irrigation Show and Education Conference, Las Vegas convention center, 2-6 December, Las Vegas, NV, USA
- **Travel Award by the Biological Systems Engineering Dept. of WSU** for 2019 American Society of Agricultural and Biological Engineers (ASABE) Annual Meeting in Boston, MA, July 7-10, 2019
- Biological Systems Engineering Outstanding Graduate Student Awards – 2018 WSU
- Sponsored candidate from **Water Irrigation System Evaluation (WISE)** group for **Irrigation Systems Evaluations** training course at **ITRC, California Polytechnic State University**, San Luis Obispo, CA

- Certified under FFA Course Number ALC-451 for **Part 107 Small Unmanned Aircraft Systems, (completion number= 0892984-20170410-00451)**
- A Sponsored Participant in the **Young Water Leader Summit (YWLS) at the Singapore International Water Week (SIWW)** as a **PhD Student**, Gallery Cafe, level 2, Marina Barrage, Singapore (May 31- June 1, 2014)
- Selected for PhD scholarship under “**50 Overseas Scholarship Program for UAF**” from university of Agriculture Faisalabad

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## **Professional Societies Membership**

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- American Society of Agricultural and Biological Engineers (ASABE)
- Canadian Society for Bioengineering (CSBE)
- United States Committee on Irrigation and Drainage (USCID)
- Pakistan Society of Agricultural Engineers (PSAE)
- ICID Young Professional e-Forum (IYPeF)
- World Youth Parliament for Water (WYPW)
- Pakistan Engineering Council (PEC), AGRI/3500

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## **Computer Skills/Languages**

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- ArcGIS/QGIS, METRIC, Pix4D, GEE, WinSRFR, ENVI, SWAT, SRM, GeoWEPP, HEC-HMS, and JMP
- Python, MATLAB, VBA, Machine learning techniques, and CR Basic (not good but can work with all)