Dr. Ghulam Hussain Dars

Assistant Professor

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https://scholar.google.com/citations?user=L7W4R9IAAAAJ&hl=en

1. Summary

Dr. Dars has been working at the U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W), Mehran University of Engineering and Technology, Jamshoro as an Assistant Professor since May 2015. He has done his Ph.D. in Integrated Water Resource Management (IWRM) from USPCAS-W, Mehran UET, Jamshoro. Dr. Dars is an expert in climate resilience and water management, with more than nineteen years of experience in developing sustainable models for the Indus Basin and addressing the challenges of limited data in water resources planning and management. Dr. Dars is an author or co-author of 15 peer-reviewed publications (total Impact factor is 34.66), one book chapter, and one article for the ASCE conference. His extensive research portfolio includes water accounting, climate change impact analysis, hydrological modeling, water resources management under uncertainty, GIS and Remote Sensing, and downscaling of climate models.

2. Education

- **Ph.D. (IWRM)** | USPCAS-W, Mehran UET, Jamshoro, Pakistan | Jan. 2018 to Oct. 2022
- **MS (Civil and Environmental Engineering)** | Portland State University, Oregon, United States | September 2011 to August 2013
- **Intensive English Language Program (IELP)** | Portland State University, Oregon, United States | June 2011 to August 2011
- **B.E. (Civil Engineering)** | Civil Engineering Department, Mehran UET, Jamshoro, Pakistan | Feb. 2000 to March 2004

3. Professional Experience

May 18, 2015 – Present **USPCAS-W, Mehran UET Jamshoro**

Assistant Professor

Job Description

- Teaching to Grad Students (Climate Change and Water Resources; Design of Hydraulic Structures).
- Teaching to UG students (Climatology, Water and CC, Env. Fluid Mechanics & Applied Hydraulics).
- Researching climate resilience and water resources.
- Supervise graduate students on their research projects.
- Write grant proposals to secure funding for research projects and conferences.
- Participate in curriculum development and diversity and inclusion.
- Organize the national and international conferences.
- Training Coordinator - Write proposals for conducting trainings.
- Member of the admission committee.
- In charge of the Water Informatics/Hydraulics Lab.

Key Achievements

- Published 15 papers in the HEC recognized journals (total Impact factor is 34.66).
- Supervised 20 MS students as their supervisor and co supervisors.
- International Collaboration (University of Cambridge, ICIMOD, City School of New York, US).
- Secured funding for different projects.
- Participate in curriculum development and diversity and inclusion (BSES, MS and Ph.D).
- National and international conferences – SP3C 2017 Islamabad, IFMCC 2023
- Training Coordinator – Conduct 11 trainings for Govt. of Sindh, Govt. of Balochistan and Govt. of Pakistan in last five years. Moreover, a website for the training purpose has been developed (trainingwater.muet.edu.pk).
- IoT Unit in the Water Informatics/Hydraulics Lab

August 21, 2008 - May 17, 2015 **Research Officer (Water Section)**

Planning Commission, Ministry of Planning, Development and Special Initiatives, Government of Pakistan, Islamabad

Job Description

- Formulation of water resources plans (Long, Medium- and Short-Term Plans).
- Technical and economic scrutiny of water-related development projects/programs.
- Investment programming (PSDP formulation) of the water sector.
- Monitoring and evaluation of federally funded water-related development projects.

Key Achievements

- Vision 2030, Five Year Plans and Annuals Plans.

May 02, 2005 - August 08, 2008 **Water Management Officer**
On Farm Water Management
Agriculture, Supply and Prices
Department, Govt. of Sindh

Job Description

- Formulation of Water Users Association (WUAs).
- Conducting Surveys and preparing Technical Designs and BOQs of Watercourses.
- Monitoring and evaluation of watercourses

April 01, 2004 - September 30, 2004 **Trainee Engineer**
Associated Consulting Engineers (ACE)
Karachi

Job Description

- Designing of small dams.
- Preparing BOQs.
- Report writing.

4. Publications/Book Chapters/International Conferences

Articles

1) Ahmed, Waqas, Suhail Ahmed, Jehangir F. Punthakey, **Ghulam Hussain Dars**, Muhammad Shafqat Ejaz, Abdul Latif Qureshi, and Michael Mitchell. "Statistical analysis of climate trends and impacts on groundwater sustainability in the Lower Indus Basin." *Sustainability* 16, no. 1 (2024): 441. (IF = 3.9)

2) Hannan, Muhammad, **Ghulam Hussain Dars**, Muhammad Ukasha, and Kamran Ansari. " Spatio-Temporal Dynamics of Groundwater Storage in Pakistan from Gravimetric Observations." *Journal of Hydrologic Engineering* (submitted) (IF = 2.2)

3) Ahmed, Mansoor, **Ghulam Hussain Dars**, Suhail Ahmed, and Nir Y. Krakauer. "Analyzing drought trends over Sindh Province, Pakistan." *Natural Hazards* 119, no. 1 (2023): 643-661. (IF = 3.7)

4) Lund, Jewell, Richard R. Forster, Yusuf Jameel, Summer B. Rupper, Elias J. Deeb, **Ghulam Hussain Dars**, Azhar Zaheer et al. "Constraining Mountain Streamflow Constituents by Integrating Citizen Scientist Acquired Geochemical Samples and Sentinel-1 SAR Wet Snow Time-Series for the Shimshal Catchment in the Karakoram Mountains of Pakistan." *Water Resources Research* 59, no. 3 (2023): e2022WR032171. (IF = 6.16)

5) Rafi, Fehmida, **Ghulam Hussain Dars**, Courtenay Strong, Kamran Ansari, and Syed Hammad Ali. "An Evaluation of the Extreme Rainfall Event of 2010 over the Kabul River Basin using the WRF Model." *Engineering, Technology & Applied Science Research* 12, no. 1 (2022): 8017-8022. (IF = 1.5)

6) Ahmed, Mansoor, **Ghulam Hussain Dars** and Habibullah Abbasi. **"**Calibrating and Validating the Soil Water Assessment tool on the NaiBaran Catchment**.**" *SindhUniv. Res.Jour. (Sci. Ser.),* 53, no. 1, (2021): 59-66.

7) **Dars, Ghulam Hussain**, Mehran Sattar, Muhammad Touseef, Courtenay Strong, and Muhammad Raza Najafi. "Study of multi-model ensemble high-resolution projections of major climatic variables over the Indus River Basin and Pakistan." *Mehran University Research Journal Of Engineering & Technology* 40, no. 1 (2021): 104-115. (IF = 0.6)

8) **Dars, Ghulam Hussain**, Courtenay Strong, Adam K. Kochanski, Kamran Ansari, and Syed Hammad Ali. "The spatiotemporal variability of temperature and precipitation over the upper Indus Basin: An evaluation of 15 year WRF simulations." *Applied Sciences* 10, no. 5 (2020): 1765. (IF = 2.7)

9) Naz, Falak, **Ghulam Hussain Dars**, Kamran Ansari, Shoaib Jamro, and Nir Y. Krakauer. "Drought trends in Balochistan." *Water* 12, no. 2 (2020): 470. (IF = 3.4)

10) Mahessar, Ali Asghar, Sumera Qureshi, Abdul Latif Qureshi, Kamran Ansari, and **Ghulam Hussain Dars**. "Impact of the Effluents of Hyderabad City, Tando Muhammad Khan, and Matli on Phuleli Canal Water." *Engineering, Technology & Applied Science Research* 10, no. 1 (2020). (IF = 1.5)

11) Jamro, Shoaib, Falak Naz Channa, **Ghulam Hussain Dars**, Kamran Ansari, and Nir Y. Krakauer. "Exploring the evolution of drought characteristics in Balochistan, Pakistan." *Applied Sciences* 10, no. 3 (2020): 913. (IF = 2.7)

12) Jamro, Shoaib, **Ghulam Hussain Dars**, Kamran Ansari, and Nir Y. Krakauer. "Spatio-temporal variability

of drought in Pakistan using standardized precipitation evapotranspiration index." *Applied Sciences* 9, no. 21 (2019): 4588. (IF = 2.7)

13) Mahessar, Ali Asghar, Abdul Latif Qureshi, Insaf Ali Siming, Shafi Muhammad Kori, **Ghulam Hussain Dars**, Madeheea Channa, and Abdul Nasir Laghari. "Flash flood climatology in the lower region of Southern Sindh." *Engineering, Technology & Applied Science Research* 9, no. 4 (2019): 4474-4479. (IF = 1.5)

14) Krakauer, Nir Y., Tarendra Lakhankar, and **Ghulam Hussain Dars**. "Precipitation trends over the Indus basin." *Climate* 7, no. 10 (2019): 116. (IF = 3.7)

15) **Dars, Ghulam Hussain**, Mohammad Reza Najafi, and Abdul Latif Qureshi. "Assessing the impacts of climate change on future precipitation trends based on downscaled CMIP5 simulations data." *Mehran University Research Journal of Engineering and Technology* 36, no. 2 (2017): 385-394. (IF = 0.6)

16) Mahessar, Ali Asghar, Abdul Latif Qureshi, **Ghulam Hussain Dars**, and Mohammad Anwer Solangi. "Climate change impacts on vulnerable Guddu and Sukkur barrages in Indus river, Sindh." *Sindh University Research Journal-SURJ (Science Series)* 49, no. 1 (2017).

Book Chapters

17) **Dars, Ghulam Hussain**, Bakhshal Khan Lashari, Mehran Sattar Soomro, Courtenay Strong, and Kamran Ansari. "Pakistan's Water Resources in the Era of Climate Change." (Book Chapter) in Water Resources of Pakistan: Issues and Impacts. (2021). pages 95-108

18) Mahar, Rasool Bux, **Ghulam Hussain Dars**, and Kamran Ansari. "Water Resources of the Indus River System: Its Challenges and opportunities" (Book Chapter) **Accepted (Book publishing in progress)**

International Conferences

19) Siyal, Altaf A., Dhanji M. Misrani, **Ghulam Hussain Dars**, and Sajjad Ahmad. "Application of GIS and Remote Sensing for identification of potential runoff harvesting sites: A case study of Karoonjhar mountainous area, Pakistan." In *World Environmental and Water Resources Congress 2018*, pp. 20-33. Reston, VA: American Society of Civil Engineers, 2018.

5. Research Projects

S. No.	Title of Research Project	Funding Agency	Cost (PKR in Million)	Role	Status
1	Managing uncertainties in projected impacts of climate change on	MUET/USAID	1.631	P.I	Completed in 2017

	precipitation patterns in Pakistan				
2	Changing climate in Pakistan: Food Security and Water Management Implications (Produce high-resolution climate simulations for complex terrain)	MUET/USAID	3.12	P.I	Completed in 2018
3	Improved hydro-meteorological forecasts under changing climate using robust modeling techniques	MUET/USAID	2.76	P.I	Completed in 2019
4	Partitioning contributions between glacier melt, snowmelt, groundwater and precipitation for a major headwater Indus River tributary	MUET/USAID	3.00	Technical Expert	Completed in 2019
5	Conducting Water Availability Study in the Catchment Area of Darawat Dam, District Jamshoro	Government of Sindh	3.8	Hydrologist	Completed in 2023
6	Groundwater Mapping and Modeling for Sanghar and UmerKot Areas, Sindh	FAO, Pakistan	7.4	Technical expert on Climate change	Completed in March 2024
7	Safety Evaluation and Adaptation Mechanism of Water-Energy-Food Nexus in CPEC under Climate Change	Pakistan Science Foundation	3.504	Technical Expert on Climate Change	Project running
8	Impact Assessment of Small Dams constructed under the Sindh Resilience Project (SRP) in the Sindh Province	Government of Sindh	45.475	Hydraulic Design Engineer	Project running
9	Water Governance for Sindh Activity	USAID, Pakistan	182.854	Training Coordinator	Project running
10	Hydro Agro Informatics (HAI) Center (Design Phase)	Government of Sindh/World Bank	57.600	Senior Hydrologist	Project approved and will be started in August

6. SCHOLARSHIPS/RECOGNITIONS/ACHIEVEMENTS:

- Foreign Fulbright Scholarship for studying MS in Civil and Environmental Engineering in the US.

- USAID Scholarship for One Semester Exchange Visit program to the US (University of Utah).
- Asia-Pacific Network (APN) Fellowship to attend International Training on Ecosystem-Climate Interactions was to be held on September 8-20, 2014 in Beijing, China.
- On the Presidents' list for achieving a GPA of 4.0 in the IELP Course at Portland State University.
- Appreciation letter from the Director USPCASW (Dr. Rasool Bux Mahar) on the BoG resolution (Resolution No. BoG 9.3(e))

7. TRAININGS/SHORT COURSES

S. No.	Title of the Training	Duration and Dates	Funding Organization	Location
As a Participant				
1.	**Water Accounting (total 5 trainings of 5 days each)**	2023 – 2024	FAO, Pakistan	Tando Jam and Islamabad
2.	**Glacier Modeling: Practical Applications with the Open Global Glacier Model**	5 days 11-03-23 to 15-03-23	ICIMOD, LUMS, HUC	LUMS, Lahore.
3.	**Satellite remote sensing for estimation of evapotranspiration**"	4 days 17-01-23 to 20-01-23	FAO, Pakistan	SAU, Tando Jam
4.	**Potential training on Crop Mapping**	4 days 31-10-22 to 03-11-22	FAO, Pakistan	Indus Hotel, Hyderabad
5.	**Python for Evapotranspiration Estimates**	2 days 27-09-22 to 28-09-22	FAO, Pakistan	FAO Office, Hyderabad
6.	**Sediment management at Sukkur Barrage**	1 day 05-08-22	Irrigation Department, Sindh	Gymnasium, Hyderabad
7.	**Satellite Altimetry and its Hydrological Applications**	4 days 27-11-18 to 30-11-18	USPCASW, MUET, Jamshoro	USPCASW, MUET, Jamshoro
8.	International Training Workshop on **"The Community WRF-Hydro Modeling System"**	4 days 23-10-18 to 26-10-18	USAID/MUET	National Center for Atmospheric Research (NCAR), CO, United States
9.	International Workshop on **"Overview of hydrologic and hydraulic modeling using HEC-HMS and HEC-RAS"**	1 day 29-11-17	USAID/M/o Water Resources, Govt. of Pakistan	Islamabad

10.	**Data Analysis using SPSS**	4 days 20-11-17 to 23-11-17	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
11.	**Introduction to Geoprocessing with Python**	5 days 03-04-17 to 07-04-17	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
12.	**CSIRO Integrated Water Resource Modeling Workshop**	5 days 14-03-16 to 18-03-16	CSIRO, Australia	Avari Hotel, Lahore
13.	**Water Conservation and Efficient Irrigation Water Management Techniques**	3 days 18-08-15 to 20-08-15	MUET/USDA/ ICARDA	USPCASW, MUET Jamshoro
14.	**Pond Design and Management**	2 days 05-08-15 to 06-08-15	USDA/IWMI	NARC, Islamabad
15.	**System Dynamics using STELLA**	3 days 06-07-15 to 08-07-15	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
16.	**Hydrological Modeling using HEC-RAS**	3 days 01-07-15 to 03-07-15	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
17.	**Hydrological Modeling using HEC-HMS**	3 days 24-06-15 to 26-06-15	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
18.	**Effective Teaching**	3 days 06-06-15 to 08-06-15	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
19.	**Flood Forecasting**	3 days 28-05-15 to 30-05-15	Govt. of Sindh/MUET	USPCASW, MUET Jamshoro
As a Resource Person				
1.	**Groundwater Mapping and Modeling for Sanghar and Umerkot Areas**" for the officials of Govt. of Sindh	2 days 29-02-24 to 01-03-24	FAO, Pakistan	USPCASW, MUET Jamshoro
2.	**Water Management**" for the officials of Govt. of Sindh	3 days 29-11-23 to 01-12-23	Govt. of Sindh	USPCASW, MUET Jamshoro
3.	**Networking System and Designing of Water Supply Engineering**" for the officials of Govt. of Balochistan	2 Weeks 13-11-23 to 25-11-23	Govt. of Balochistan	Quetta
4.	**IWRM, Hydrology, Hydraulic Structures, GIS, Climate Change, Participatory Irrigation**" for the officials of Govt. of Balochistan	1 month 30-10-23 to 25-11-23	Govt. of Balochistan	Quetta
5.	**Understanding of PAD and PC-I**" for the officials of Govt. of Sindh	2 days 09-11-22 to 10-11-22	Govt. of Sindh	USPCASW, MUET Jamshoro
6.	**GIS and Remote Sensing Utilization in IWRM** for the officials of Govt. of Balochistan	10 days 10-03-22 to 20-03-22	Govt. of Balochistan	USPCASW, MUET Jamshoro

7.	**Construction Management and Procurement** for the officials of Govt. of Balochistan	10 days 15-11-21 to 25-11-21	Govt. of Balochistan	USPCASW, MUET Jamshoro
8.	**Innovative Techniques of Designing Hydraulic Structures**" for the officials of Govt. of Balochistan	15 days 11-10-21 to 25-10-21	Govt. of Balochistan	USPCASW, MUET Jamshoro
9.	**Use of GIS in natural resource conservation & database management**" for the officials of Govt. of Balochistan	5 days 01-03-21 to 05-03-21	Govt. of Balochistan	USPCASW, MUET Jamshoro
10.	**Integrated Water Resources Management for the Mid-Level Water Professionals of Sindh**	5 days 17-08-20 to 21-08-20	M/o Water Resources, Govt. of Pakistan	USPCASW, MUET Jamshoro
11.	**Climate resilience in water resources planning and management**	4 days 21,22,28,29 February, 2020	USPCASW, MUET Jamshoro/University of Utah	USPCASW, MUET Jamshoro
12.	**From Flood Management to Managing Water Economics**	2 days 23-04-19 to 24-04-19	UNESCO/JICA	Islamabad
13.	**Climate Change Projections and its Impact on Water System Performance**	2 days 17-08-17 to 18-08-17	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
14.	**Climate Vulnerability Assessment and Adaptation of Water Systems in Pakistan**	2 days 17-05-17 to 18-05-17	USPCASW, MUET Jamshoro	USPCASW, MUET Jamshoro
15.	**Hydraulic Modeling using HEC-RAS** for the officials of Govt. of Sindh	5 days 11-05-16 to 15-05-16	Govt. of Sindh	USPCASW, MUET Jamshoro
16.	**Geo-Informatics**	3 days 05-04-16 to 07-04-16	USEFP	USPCASW, MUET Jamshoro

8. Students Supervised

S. No.	Student's Name	Thesis Title	Status
1	Mohammad Touseef	Detecting the likely impacts of climate change on future precipitation under CMIP5 climate scenarios in Pakistan	MS Completed
2	Mehran Sattar	Performance Evaluation of Two Statistical Downscaling Methods in Complex Terrain: A Case Study of Pakistan	MS Completed
3	Fehmida Rafi	Evaluation of Extreme Rainfall Event of 2010 over Kabul River Basin using WRF Model	MS Completed
4	Nayyab Agha	Sensitivity Analysis of Weather Research and Forecasting (WRF) Model to different parameterization schemes over the	MS Completed

		Upper Indus Basin	
5	Mansoor Jiskani	Modeling Hydrological Response of Nai Baran Catchment in Changing Climate	MS Completed
6	Shoaib Jamro	Drought regionalization and Spatio-temporal variability in Pakistan using Standardized Precipitation Evapotranspiration Index (SPEI)	MS Completed
7	Falak Naz	Analysis of extreme events in Balochistan province under changing climate	MS Completed
8	Samina Laghari	Rainfall Frequency Analysis using Log-Pearson Type-III Distribution In Sindh Province	MS Completed
9	Dolat Singh	Rainfall-Runoff Modelling Using HEC-HMS Model, In LBOD Catchment	MS Completed
10	Noman Laghari	Drought projections in Balochistan under Changing climate	MS Completed
11	Abdul Wahid Mengal	Precipitation Trend Analysis Over Balochistan, Pakistan	MS Completed
12	Dhanji Mal	GIS-based Decision Support System for identification of runoff harvesting potential sites: A case study of Karoonjhar mountainous area	MS Completed
13	Sohail Ahmed	Effects of Climate Change on Ground Water Budget: A Case Study of Northern Rohri Canal Command	MS Completed
14	Sheva Ram	Hydraulic Assessment of Spinal Drain under different flow conditions	MS Completed
15	Parkash Kumar	Quantification of seepage losses from lined and unlined distributaries using Acoustic Doppler Current Profiler (ADCP)	MS Completed
16	Muhammad Hannan	Estimation of Spatio-Temporal Dynamics of Groundwater Storage in Pakistan from Gravimetric Observations	MS Completed
17	Asad Ali Ghanglo	Assessment of Glacier Dynamics in the Hunza Basin, Karakoram Region	MS Completed
18	Mir Hassan	Assessment of Climate Change Impacts on the future flows of the Darawat Catchment	In progress
19	Bakhtawar Ayaz	Analysis of future temperature and precipitation projections in Sindh Province using CMIP6 Data	In progress
20	Mirza Muhammad Ahmed	Mapping field scale actual Evapotranspiration using SSEBOP Model with data fusion of multi-source satellite imagery: A Case study in Tando Jam, Sindh, Pakistan	In progress

9. COMPUTER SKILLS:

i) Weather and Research Forecasting (WRF) Model

ii) WRF-Hydro Model

iii) Aqua Crop Model

iv) Google Earth Engine (GEE)

v) Soil and Water Assessment Tool (SWAT) Model

vi) ArcGIS and QGIS

vii) Python, R and Matlab Programming Languages

viii) HEC-HMS Model

ix) HEC-RAS Model

x) NetCDF Operator (NCO)

xi) CLIMWAT Model

10. LANGUAGES:

i) English (Advance);

ii) Urdu (Advance);

iii) Sindhi (Mother tongue)

11. REFERENCES:

i) Dr. Ashfaque Ahmed Pathan, Professor (Civil Engineering), BPS-21, Mehran UET Jamshoro, Sindh (0333 3905457; ashfaque.pathan@faculty.muet.edu.pk)

ii) Dr. Asghar Ali Halepoto, Chief (Water Resources Section), BPS-20, Ministry of Planning, Development & Special Initiatives, Islamabad (0300 3275971; a_halepoto@yahoo.com)

iii) Dr. Courtenay Strong, Professor, Department of Atmospheric Sciences, University of Utah,

Salt Lake City, Utah, USA (court.strong@utah.edu)