

Curriculum Vitae



Ghulam Hussain Dars, Ph.D. (IWRM)
Associate Professor, USPCAS-W,
Mehran UET Jamshoro

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



SUMMARY

Dr. Dars is currently serving as an Associate Professor at the U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W), Mehran UET, Jamshoro, Pakistan. He holds a **Ph.D. in Integrated Water Resources Management (IWRM)** from USPCAS-W, MUET, and an **M.S. in Civil and Environmental Engineering** from **Portland State University, USA**, as a **Fulbright Scholar**.

Dr. Dars has more than **21 years of experience** in water resources planning and management, climate resilience, and Hydroinformatics, with more than 10 years of experience in teaching/research at MUET Jamshoro. He has developed a strong graduate supervision portfolio in the fields of IWRM, Hydrology, Climate Change, GIS and Remote Sensing, Hydro-informatics, and Groundwater Management. He has supervised and co-supervised **32 graduate (M.S.) research theses, and 5 Ph.D. scholars**. Of these, 26 M.S. students have successfully graduated, while 6 students are currently under supervision or co-supervision.

He has established a strong research portfolio in water resources, climate change, and hydro-informatics, with **18 peer-reviewed journal publications (Impact Factor of 49.5), two book chapters, and two international conference papers (ASCE-EWRI)**. His research focuses on addressing critical water and climate challenges, Hindu Kush–Karakoram–Himalaya (HKH) region, and Indus Delta. His publications cover a wide range of topics, including **Integrated Water Resources Management (IWRM), water security, drought assessment and projections, climate change impact assessment, precipitation downscaling, groundwater storage dynamics using GRACE satellite observations, hydrological and hydraulic modeling, climate model evaluation and downscaling (CMIP5/CMIP6 and CORDEX), water accounting, river basin management, and GIS and remote sensing applications**. His work has contributed to advancing scientific understanding of climate resilience, sustainable water management, and decision-support systems for the Indus Basin.

He has actively contributed to the design and implementation of **13 multidisciplinary research and consultancy projects** in the fields of water resources management, climate resilience, hydro-informatics, groundwater management, water governance, and environmental sustainability, with a cumulative project portfolio exceeding **PKR 430 million**. His work has encompassed the development of the **Hydro Agro Informatics (HAI) Program** for Sindh, waterlogging and salinity assessment, groundwater mapping and modeling, watershed and water availability studies, impact assessment of small dams, climate change modeling and uncertainty analysis, hydro-meteorological forecasting, glacier and snowmelt hydrology, and Water-Energy-Food (WEF) Nexus research. These projects have been supported by leading national and international funding agencies, including the **World Bank (WB), Government of Sindh, Govt. of Balochistan, USAID, Food and Agriculture Organization (FAO), Australian Centre for International Agricultural Research (ACIAR), Pakistan Science Foundation (PSF)**. Through these initiatives, Dr. Dars has contributed to the development of evidence-based policies, decision-support systems, and innovative solutions for sustainable water security and climate adaptation in Pakistan, particularly within the Indus Basin.



EDUCATION

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



PROFESSIONAL EXPERIENCE

Assistant Professor From 18-05-2015 to 22-01-2025

Associate Professor From 22-01-2025 to Present

USPCAS-W, MUET Jamshoro

Job Description

- Teaching to Doctoral/PG/UG Students
- Researching climate resilience and water resources.
- Supervise graduate students on their research projects.
- Sectional Head of MS Hydraulics, Irrigation and Drainage (HID) Program
- Sectional Head of MS Climate Change and Environmental Informatics (CCEI) Program
- 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 18 papers in HEC-recognized journals with a total IF of 49.5.
- Supervised 32 MS students in water-related research.
- Supervising 5 Ph.D. students in water-related research.
- Conducted 28 trainings for Sindh and Balochistan officials;
- Developed **trainingwater.muett.edu.pk**.
- Established an IoT Unit in the Water Informatics & Hydraulics Lab.
- Built collaborations with the University of Alabama, UU, University of Cambridge, ICIMOD, and others.
- Presented at SP3C-2017, IFMCC 2023, WGCR-2025.
- Secured project funding

Research Officer (Water Section), Planning Commission, Ministry of Planning, Development and Special Initiatives, Government of Pakistan, Islamabad. From 21-08-2008 To 17-05-2015

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

Water Management Officer, OFWM, Agriculture, Supply and Prices Department, Govt. of Sindh. From 02-05-2005 To 08-08-2008

Job Description

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

Key Achievements

- Successfully established and strengthened **Water Users Associations (WUAs)** to promote participatory irrigation management and sustainable operation and maintenance of watercourses.



ACHIEVEMENTS/RECOGNITIONS:

- Supervised **32 graduate (M.S.) students (6 in process)**, and **5 Ph.D. scholars**.
- Active Contribution in the design and implementation of **13 multidisciplinary research and consultancy projects** (cumulative portfolio exceeding **PKR 430 million**).
- Program Head of MS and Ph.D in **Hydraulics, Irrigation and Drainage (HID)**
- Program Head of MS in **Climate Change and Environmental Informatics (CCEI)**
- Published **18 papers** in HEC-recognized journals with a total **IF of 49.5**.
- Developed **trainingwater.muett.edu.pk**. Conducted **28 trainings** for Sindh and Balochistan.
- Established an **IoT Unit** in the Hydraulics Lab and Water Informatics.
- Built/sustained **collaborations** with the University of Alabama, University of Utah, University of Cambridge, FutureWater Netherland, ICIMOD, FAO, PMD, WAPDA, SID, SASP, SAU Tando Jam, UET Lahore, LUMS Lahore, GCISC, Planning Commission, Federal Flood Commission, Government of Balochistan, GIKI, UET Peshawar, and others.
- Organized major conferences at the Center including **SP3C-2017, IFMCC 2023, WGCR-2025**.
- **Foreign Fulbright Scholarship** for studying MS in Civil and Environmental Engineering in the United States.
- **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, United States.
- Appreciation letter from the Director USPCASW on the BoG resolution (Resolution No. BoG 9.3(e)).



RESEARCH PUBLICATIONS

Research Articles

S.No.	Name of the Article	Journal (IF)
1.	Modeling streamflow dynamics under future land use scenarios using soil and water assessment tools (2026)	GJESM (IF – 2.9)
2.	Probabilistic precipitation downscaling for ungauged mountain sites: a pilot study for the Hindu Kush Karakoram Himalaya (2025)	EGUSphere-HESS (IF – 7.0)

3.	Spatio-Temporal Dynamics of Groundwater Storage in Pakistan from Gravimetric Observations (2024)	ASCE-Journal of Hydrologic Engineering (IF - 2.2)
4.	Statistical analysis of climate trends and impacts on groundwater sustainability in the Lower Indus Basin (2024)	Sustainability (IF – 4.1)
5.	Analyzing drought trends over Sindh Province, Pakistan (2023)	Natural Hazards (IF – 4.5)
6.	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 (2023)	AGU - Water Resources Research (IF – 6.6)
7.	An Evaluation of the Extreme Rainfall Event of 2010 over the Kabul River Basin using the WRF Model (2022)	ETASR (IF – 1.5)
8.	Calibrating and Validating the Soil Water Assessment tool on the NaiBaran Catchment (2021)	SURJ (Science Series) (IF – Nil)
9.	Study of multi-model ensemble high-resolution projections of major climatic variables over the Indus River Basin and Pakistan (2021)	MURJET (IF – 0.9)
10.	The spatiotemporal variability of temperature and precipitation over the upper Indus Basin: An evaluation of 15-year WRF simulations (2020)	Applied Sciences (IF – 2.9)
11.	Drought trends in Balochistan (2020)	Water (IF – 3.5)
12.	Impact of the Effluents of Hyderabad City, Tando Muhammad Khan, and Matli on Phuleli Canal Water (2020)	ETASR (IF – 1.5)
13.	Exploring the evolution of drought characteristics in Balochistan, Pakistan (2020)	Applied Sciences (IF – 2.9)
14.	Spatio-temporal variability of drought in Pakistan using standardized precipitation evapotranspiration index (2019)	Applied Sciences (IF – 2.9)
15.	Flash flood climatology in the lower region of Southern Sindh (2019)	ETASR (IF – 1.5)
16.	Precipitation trends over the Indus basin (2019)	Climate (IF – 3.7)
17.	Assessing the impacts of climate change on future precipitation trends based on downscaled CMIP5 simulations data (2017)	MURJET (IF – 0.9)
18.	Climate change impacts on vulnerable Guddu and Sukkur barrages in the Indus River, Sindh (2017)	SURJ (Science Series) (IF – Nil)

Book Chapters

1.	Pakistan's Water Resources in the Era of Climate Change (2021)	Water Resources of Pakistan: Issues and Impacts
2.	Water Resources of the Indus River System: Its Challenges and Opportunities (2024)	Indus Water System. NCE in Geology, University of Peshawar & Pakistan Academy of Sciences, Islamabad, Pakistan

International Conferences

1.	Application of GIS and Remote Sensing for identification of potential runoff harvesting sites: A case study of Karoonjhar mountainous area, Pakistan (2018)	EWRC-ASCE
2.	Precipitation and Indian Ocean Climate Variability—A Case Study on Pakistan (2017)	EWRC-ASCE



RESEARCH PROJECTS

Research / Consultancy Project	Total Cost	Funding Agency
Soil Survey, Analysis, Mapping – Integrated Waterlogging and Salinity Program	(Rs. 13.5 Million)	GoS/WB
Hydro Agro Informatics (HAI) Program (Design Phase)	(Rs. 87.6 Million)	GoS/WB
Impact Assessment of 56 Small Dams constructed under the Sindh Resilience Project (SRP) in the Sindh Province	(Rs. 45.475 Million)	GoS/WB
Impact Assessment of 14 Small Dams Constructed under the Sindh Resilience Project (SRP) in the Sindh Province	(Rs. 26.1 Million)	GoS/WB
Safety Evaluation and Adaptation Mechanism of Water-Energy-Food (WEF) Nexus in CPEC under Climate Change	(Rs. 3.504 Million)	PSF
Transformation through adoption of trees and shrubs for salinity management in the Southern Indus Basin, Pakistan	(AUS 250,197)	ACIAR
Water Governance for Sindh Activity	(Rs. 182.854 Million)	USAID
Groundwater Mapping and Modeling for Sanghar & Umerkot Areas, Sindh	(Rs. 7.4 Million)	FAO
Conducting Water Availability Study in the Catchment Area of Darawat Dam, District Jamshoro	(Rs. 3.8 Million)	GoS/WB
Partitioning contributions b/w glacier melt, snowmelt, groundwater & precipitation for a major headwater Indus River tributary	(Rs. 6.14 Million)	USAID /MUET/UU
Improved hydro-meteorological forecasts under changing climate using robust modelling techniques	(Rs. 2.76 Million)	USAID /MUET
Changing climate in Pakistan: Produce high-resolution climate simulations for complex terrain	(Rs. 3.12 Million)	USAID /MUET
Managing uncertainties in the projected impacts of climate change on precipitation patterns in Pakistan	(Rs. 1.631 Million)	USAID /MUET



COMPUTER SKILLS:

Programming Languages	Python, R, Matlab and Google Earth Engine (GEE)
Hydrological Models	HEC-HMS, Soil and Water Assessment Tool (SWAT) Model, WRF-Hydro
Glacier Model	Open Global Glacier Model (OGGM)
Agriculture/Crop Models	Aqua Crop Model, CROPWAT
Numerical Weather Prediction System/Model	Weather and Research Forecasting (WRF) Model;
GIS Tools	ArcGIS and QGIS
Hydraulic Modeling	HEC-RAS Model
Data Processing/Database	NetCDF Operator (NCO), CLIMWAT
Ecosystem/Climate Vulnerability Assessment Tools	INVEST suite of models



TRAININGS/SHORT COURSES

S. No.	Title of the Training
	As a Trainee
1.	Training on Projected Climate Data from the Climate and Agriculture Risk Visualization and Assessment (CAVA) Tool by FAO
2.	Water Accounting (total 5 trainings of 5 days each)
3.	Glacier Modeling: Practical Applications with the Open Global Glacier Model
4.	Machine Learning and GRACE Applications in Water Resources
5.	Satellite remote sensing for estimation of evapotranspiration"
6.	Potential training on Crop Mapping
7.	Python for Evapotranspiration Estimates
8.	Sediment management at Sukkur Barrage
9.	Satellite Altimetry and its Hydrological Applications
10.	International Training Workshop on "The Community WRF-Hydro Modeling System"
11.	International Workshop on "Overview of hydrologic and hydraulic modeling using HEC-HMS and HEC-RAS"
12.	Data Analysis using SPSS
13.	Introduction to Geoprocessing with Python
14.	CSIRO Integrated Water Resource Modeling Workshop
15.	Water Conservation and Efficient Irrigation Water Management Techniques
16.	Pond Design and Management
17.	System Dynamics using STELLA
18.	Hydrological Modeling using HEC-RAS
19.	Hydrological Modeling using HEC-HMS
20.	Effective Teaching
21.	Flood Forecasting

	As a Resource Person
1.	Groundwater Mapping and Modeling for Sanghar and Umerkot Areas” for the officials of Govt. of Sindh
2.	Water Management” for the officials of Govt. of Sindh
3.	Networking System and Designing of Water Supply Engineering” for the officials of Govt. of Balochistan
4.	IWRM, Hydrology, Hydraulic Structures, GIS, Climate Change, Participatory Irrigation” for the officials of Govt. of Balochistan
5.	Understanding of PAD and PC-I” for the officials of Govt. of Sindh
6.	GIS and Remote Sensing Utilization in IWRM for the officials of Govt. of Balochistan
7.	Construction Management and Procurement for the officials of Govt. of Balochistan
8.	Innovative Techniques of Designing Hydraulic Structures” for the officials of Govt. of Balochistan
9.	Use of GIS in natural resource conservation & database management” for the officials of Govt. of Balochistan
10.	Integrated Water Resources Management for the Mid-Level Water Professionals of Sindh
11.	Climate resilience in water resources planning and management
12.	From Flood Management to Managing Water Economics
13.	Climate Change Projections and its Impact on Water System Performance
14.	Climate Vulnerability Assessment and Adaptation of Water Systems in Pakistan
15.	Hydraulic Modeling using HEC-RAS for the officials of Govt. of Sindh
16.	Geo-Informatics



DOCTORAL/PG STUDENTS SUPERVISION

ID	Supervisor /Co-supervisor	Roll Number	Topic	Status
Ph.D Students				
01	Supervisor	22PhD-IWRM-02	Impact of Climate Change on Stream Flow Dynamics of Kabul River Basin at Warsak Dam using SWAT and Statistical Approaches: Policy and Transboundary Implications	In progress
02	Supervisor	21PhD-HID-02	Exploring the Climate Impacts on the Yield of Wheat Crop under Different Agro Climatic Conditions and Irrigation Practices in Tando Jam	In progress
03	Co-Supervisor	23PhD-IWRM-03	Integrated Assessment of Urbanization and Climate Change Impacts on Groundwater Characteristics of Quetta Sub Basin, Balochistan	In progress
04	Co-Supervisor	21PhD-CE-01	Sediment Transport and Deposition Patterns in the Indus River from Guddu Barrage to Delta	In progress
05	Co-Supervisor	24PhD-CE-01	Comparison of Agricultural Productivity in Conventional Irrigation Method and Smart Irrigation System in Sindh	In progress
MS Students				
1	Supervisor	15MS-IWRM-07	Predicting the Climate Change Impacts on Future Precipitation Trends in Pakistan Using CMIP5 Climate Scenarios	Graduated
2	Supervisor	16MS-IWRM-05	Performance Evaluation of two statistical downscaling methods in complex terrain: A case study of Pakistan	Graduated
3	Supervisor	17MS-IWRM-06	Analysis of Extreme Events in Balochistan Province under Changing Climate	Graduated
4	Supervisor	17MS-IWRM-12	Drought Regionalization and Spatiotemporal Variability in Pakistan using Standardized Precipitation Evapotranspiration Index	Graduated

5	Supervisor	18S-MS-IWRM-09	Development of Flood Analysis System on LBOD Using IFAS Model	Graduated
6	Supervisor	18MS-IWRM-02	Modeling the Hydrological Response of Darawat Catchment under in Changing Climate	Graduated
7	Supervisor	18MS-IWRM-06	Sensitivity Analysis of Weather Research and Forecasting Model to different Paramaterizations Scemes over upper Indus Basin	Graduated
8	Supervisor	18MS-IWRM-07	Evaluation Of Extreme Rainfall Event of 2010 Over Kabul River Basin Using WRF Model	Graduated
9	Supervisor	18MS-IWRM-14	Precipitation Trends Analysis Over Baluchistan Pakistan	Graduated
10	Co-Supervisor	19MS-IWRM-02	Rainfall Frequency Analysis using Log-pearson Type-III Distribution in Sindh Province	Graduated
11	Supervisor	20MS-IWRM-03	Drought projections in Balochistan under changing climate	Graduated
12	Supervisor	22MS-IWRM-10	Assessment of Glacier Dynamics in the Hunza Basin, Karakoram Region	Graduated
13	Supervisor	22MS-IWRM-16	Spatio-Temporal Groundwater Storage Variation in Pakistan Using GRACE Satellite	Graduated
14	Co-Supervisor	15MS-HID-10	GIS-Based Decision Support System for Runoff Harvesting Potential Sites: A Case Study of Karoonjhar Mountainous Area	Graduated
15	Supervisor	22MS-IWRM-01	Analysis of Future Temperature and Precipitation in Sindh Province Using CMIP6 Data	Graduated
16	Supervisor	22MS-IWRM-11	Mapping Field Scale Actual Evapotranspiration using SSEBoP Model with Data Fusion of Multi-Source Satellite Imagery: A Case Study in Tandojam, Sindh, Pakistan	Graduated
17	Supervisor	22MS-IWRM-17	Assessment of Climate Impacts on the Future Flows of the Darawat Catchment Using SWAT Model	Graduated
18	Co-Supervisor	18MS-HID-04	Evaluating of Chlorine doses and Characterization of Chlorine Tolerant Bacteria in Hyderabad Sindh	Graduated
19	Co-Supervisor	15MS-IWRM-06	Flood Analysis of Left Bank Outfall Drainage (LBOD): Using Remote Sensing and Hydraulic Modeling	Graduated
20	Co-Supervisor	18MS-HID-03	Effect of Climate Change on Ground Water Budget: A Case Study of Northern Rohri Canal Command	Graduated
21	Supervisor	23MS-IWRM-05	Assessing the Impact of Water Quality on Mangrove Health and Fish Production in Indus Delta Using Remote Sensing Techniques	Graduated
22	Supervisor	23MS-IWRM-08	Monitoring and Predicting Water Dynamics in Zangi Nawar Lake Balochistan: A Framework for Sustainable Management	Graduated
23	Supervisor	23MS-IWRM-07	Future Climate Trends for Balochistan Province Using CIMP6 Data	Graduated
24	Supervisor	23MS-IWRM-10	Assessment of Groundwater Storage Dynamics in Balochistan	Graduated
25	Co-Supervisor	23MS-IWRM-09	Assessment of the Land Surface Temperature and Vegetation Health in the Nari Basin using GIS and Remote Sensing Data	Graduated
26	Co-Supervisor	23MS-IWRM-11	Assessing the Spatio Temporal Dynamics of Mangroves in Balochistan using Remote Sensing Data	Graduated
27	Supervisor	24MS-IWRM-04	Comparative Assessment of WaPOR and ERA5-Land Over Sindh, Pakistan	In progress
28	Supervisor	24MS-HID-03	Estimation of Crop Water Productivity Using GIS and Remote Sensing Techniques: A Case Study of the Jamrao Canal Command, Mirpur Khas District, Sindh, Pakistan	In progress

28	Supervisor	24MS-HID-02	Spatial Assessment of Soil Salinity and Groundwater Quality in Sanghar District Using Multispectral Indices and Field Observations	In progress
29	Supervisor	24MS-IWRM-01	Statistical Downscaling of CMIP6 Global Climate Models Over Thatta and Sujawal, Sindh, Pakistan	In progress
30	Supervisor	24MS-IWRM-05	Assessment of Soil and Water Salinity Status in District Mirpurkhas	In progress
31	Co-Supervisor	22MS-IWRM-15	Mapping and Assessment of Soil Salinity in Kot Ghulam Mohammad Minor	In progress
32	Co-Supervisor	24MS-IWRM-03	Prediction of Flood Events under Climate Change: A Comparative Study using Hydro-Climatic Data from Sukkur Barrage	In progress



TEACHING PORTFOLIO

Ph.D.

1.	Advanced GIS Applications and Remote Sensing (Ph.D – Civil/Env. Engineering/IWRM)
2.	Water Control and Measurement (Ph.D – Civil Engineering)

MS

1.	Climate Change and Water Resources (MS – IWRM)
2.	Environmental Science and Climate Change (MS – CCEI)
3.	Design of Hydraulic Structures (MS – HID)

BSES

1.	Climatology (BSES)
2.	Applied Hydraulics (BSES)
3.	Water and Climate Change (BSES)

Laboratory Supervision

1.	Laboratory In-charge , Hydraulics and Water Informatics Lab, USPCAS-W, MUET, Jamshoro
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LANGUAGES:



English (Advance); Urdu (Advance); Sindhi (Mother tongue)



REFERENCES:



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Prof. Dr. Bakhshal Khan Lashari, Emeritus Professor USPCASW, Mehran UET Jamshoro, Pakistan +92 300 3039194; (bakhshall@yahoo.com)