



USPCAS-W
Mehran University
of Engineering & Technology
Jamshoro, Pakistan

COMPETENCY STATEMENT

**U.S.-Pakistan Center for Advanced Studies in Water
(USPCAS-W)**

**Mehran University of Engineering & Technology
Jamshoro**

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Contact:

U.S.-Pakistan Centers for Advanced Studies in Water

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INTRODUCTION

Founded with the financial support of USAID/Pakistan, USPCAS-W is headquartered at Mehran University of Engineering and Technology (MUET) in a specially-designed new building housing advanced water quality, soil salinity, water treatment, hydraulics, computational, and geospatial technologies laboratories. Modern classrooms and learning technologies provide unique educational opportunities and training possibilities. And strength in local, national, and international partnerships help USPCAS-W serve as a focal point to amplify the benefit



of research and education for advancing progress towards the targets of the United Nations Sustainable Development Goal (SDG) for Water (SDG-6).

CORE COMPETENCIES

Applied Research: The central aim of the Center is to deliver research-driven solutions with focal strengths addressing water challenges associated with SDG-6 – providing clean water and reducing risk to microbial threats, industrial wastewater treatment, soil salinity management, equity and efficiency of urban and agricultural water supply systems, water management of river basins, water infrastructure system resilience to climate change and population growth, and societal-ecosystem restoration of the Indus Delta region. Since 2014, the center has conducted 56 research projects with funding support of Rs. 260 million. A hallmark of the Center's research is nearly all projects have been implemented with national and international partners. Following this client-driven research model, the Center's research activities are co-created with stakeholders and products are linked to local and global needs. For example, USPCAS-W has worked in this fashion with Karachi-based textile, fisheries, and sugar industries on wastewater treatment and recycling projects; Australian Centre for International Agricultural Research on water-logging and salinity projects; Sindh Irrigation and Drainage Authority, Sindh Irrigation Department, and LUMS Lahore on ICT integrated projects for canal water and groundwater management projects; and Government of Sindh Public Health and WASA Hyderabad on projects to alleviate risk from antibiotic resistant microorganism.



Education Programs:

USPCAS-W research and the Pakistan water sector are supported by MS and PhD students trained in interdisciplinary MS and PhD degree programs in Hydraulics, Irrigation, and Drainage (HID); Integrated Water Resource Management (IWRM); Environmental Engineering (EE); and Water, Sanitation and Health (WaSH) Sciences. Among these, IWRM and WaSH are unique programs in Pakistan. The curriculum and co-curricular elements of the programs have been designed and refined annually based on market needs and international benchmarking in consultation with the University of Utah, Colorado State University, and University of Nevada, Las Vegas (<http://water.muuet.edu.pk/degree-programs/>). In recognition of the quality of students and education, more than 53% of graduates are employed in the water sector and around 23% are pursuing a PhD degree at leading institutions in the USA and other countries. Extending the quality graduate education, the Center has developed a Training Unit for capacity building of water sector professionals. Customized programs for short-term training workshops and long-term Diploma Programs in the areas of Water System Climate Adaptation, Drinking Water System Design, Addressing Microbial Threats in Water Systems, Flood Modeling and Management, Sediment Management, Reservoir Operations, Geospatial Analysis, Data Science, Wastewater Treatment & Reuse, Solid Waste Management, and others have been developed and delivered.

Partnerships:

A key strength of USPCAS-W is its national and international network and strong partnerships. The Center has been established through five years of close collaboration with the University of Utah, Colorado State University, and University of Nevada, Las Vegas in the USA. Formal linkages have cemented these partnerships into the foreseeable future. Linkages with USAID, ACIAR, ICARDA, Heinrich Böll Foundation – a German Foundation, and Tear Fund – a UK



based organization have established capacity building programs making immediate and sustained impact in the water sector promoting water security. Partnerships to co-create wastewater treatment solutions have been made with Karachi- and Sindh-based industries, such as Fisheries Industry, Al-Rahim Textile Industry, United Energy Pakistan Limited, and seven Sugar Mills of Sindh. Civil society and non-governmental organization partnerships with Oxfam-Pakistan and WWF-Pakistan have connected USPCAS-W closely to societal needs. And government partnerships with Pakistan Council of Research in Water Resources (PCRWR), Water Sector Improvement Project (WISP), Sindh Irrigation Department, Government of Sindh, Global Change Impact Studies Centre (GCISC), Agency for Barani Area Development (ABAD) Government of Punjab, and the National Rural Support Program (NRSP) have brought the world-class laboratory facilities and essential expertise to developing policy solutions for pressing water challenges in Sindh, Punjab, KPK, and Baluchistan.

Problem-Focused Expert Teams and Advanced Analytical Infrastructure:

U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W)

The Center is organized into teams of experts with coordinated state-of-the-art facilities to address the targets of SDG-6. Expertise of faculty members and technicians was developed through an integrated twinning training approach supported by the University of Utah, Colorado State University, University of Nevada Las Vegas, and City University of New York. Laboratory facilities that are among the best in Pakistan provide unique instruments and equipment for chemical and biological testing, fabricating and testing water and wastewater treatment prototype technologies, analyzing soil salinity and crop productivity, processing large satellite images and geospatial datasets, and computer modeling of water systems requiring high-performance computing. The knowledge and skills of the team members are supported by international partners, mentoring, professional development opportunities, and a specialized water research library for easy access to housed and online resources. The professional development and laboratory services are made available through capacity building programs (e.g., New Faculty Boot Camp, Sindh Irrigation Department Diploma Programs) and commercialization of facilities.



MISSION, VISION, VALUES

The mission of the US-Pakistan Center for Advanced Studies in Water (USPCAS-W) is to empower graduates and water sector professionals to advance water security in Pakistan with practical problem-solving skills, state-of-the-art techniques, and cutting-edge tools.

USPCAS-W is motivated by the vision of being a recognized leader in water research and education, catalyzing collaborative partnerships with academia, government, industry, and civil society to innovate technology and policy solutions to the most pressing water security problems in Pakistan and the world.

The Center operationalizes its values of equity, transparency, accountability, and efficiency through its governance structures and procedures, programs to empower women scientists and engineers, and educational opportunities to underrepresented people. Embodying this spirit, the Center's main crosscutting strategy is to achieve gender equity, and with student enrollment of 36% female and a women's hostel the Center is trending toward gender parity levels not found in engineering and technology programs related to water.

