



**USAID**  
FROM THE AMERICAN PEOPLE

U.S.-Pakistan

**Centers for Advanced Studies in Water**



We don't produce graduates

We produce Water Leaders

# USPCAS-W | Profile



**MEHRAN UNIVERSITY**  
of Engineering & Technology  
Jamshoro, Sindh, Pakistan

**THE UNIVERSITY OF UTAH**



U.S.-Pakistan

**Centers for Advanced Studies in Water**



# Profile

## Centers for Advanced Studies in **Water**

### About this Report

This report is an effort to consolidate the initiatives and activities carried out by U.S.-Pakistan Centers for Advanced Studies in Water (USPCAS-W) during the last four years (2015 – 2018).

March 2019

### Acknowledgement:

This work was made possible with the support of the United States Government and the American people through the United States Agency for International Development (USAID).

### Disclaimer:

The contents of the report are the sole responsibility of the author and do not necessarily reflect the views of USAID, the United States Government and the institution.

Partnering Universities:



**MEHRAN UNIVERSITY**  
of Engineering & Technology  
Jamshoro, Sindh, Pakistan



# SUSTAINABLE DEVELOPMENT GOALS

SO WE'RE SUPPORTING  
GLOBAL GOAL NO.

  
6


CLEAN WATER  
AND SANITATION

BY 2030 EVERYONE WILL HAVE  
SAFE WATER TO DRINK




## We Pursue SDG-6 Targets


- 6.1:




Achieve universal and equitable access to safe and affordable drinking water for all
- 6.2:




Achieve access to adequate and equitable sanitation and hygiene for all
- 6.3:




Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials
- 6.4:




Substantially increase water-use efficiency across all sectors
- 6.5:




Implement integrated water resources management at all levels
- 6.6:



Protect and restore water-related ecosystems
- 6.a:



Expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs
- 6.b:



Support and strengthen the participation of local communities in improving water and sanitation management



## FOREWARD

I feel pleasure to extend my gratitude to the USAID for the establishment of USPCAS-W at Mehran UET, Jamshoro. Keeping the global importance of water in general and Pakistan in particular, the Center with technical support of University of Utah will produce water leaders, who will resolve Country's water crisis issues through the innovative and applied research. The center is well equipped with the latest and modern research facility and and ponders its assiduity on:

- Curriculum reforms as to align it with the market needs
- High quality applied research and development of technologies for resolving water-related issues and problems of Pakistan
- Initiate and implement training and capacity building programs to equip the graduating students with necessary knowledge and skills
- Provide for sustainability by way of policy formulation and by establishing linkages with the industry and private sector organizations which deals in water.

The overall mission of this Center is to train present and future faculty, young scientists, engineers, managers and other stakeholders with state of the art techniques and cutting edge knowledge in the water sector. The Center works very closely with the students as to ensure enabling education environment and enriching social, cultural and extra-curricular activities. In essence, the Center stands for contributing solutions to Pakistan's longstanding water-related challenges and issues by educating, research, and training the next generation of water sustainability leaders through advanced academic training in different water-related disciplines. The Centre aims to find solutions in a way which carries no harm to the greener enviornment, people, or any other entity.

**Dr. Bakhshal Lashari**

Project Director  
USPCAS-W, MUET

## VICE CHANCELLOR'S MESSAGE

It has been an honor for me to lead one of the prestigious engineering universities of the country. I also feel pleasure to have been serving as Vice Chancellor at Mehran UET, where I started my career as a lecturer in 1987. However, in 1996, after having PhD from the United Kingdom, I dreamed for Mehran UET to be amongst the top universities of the country as well as in the world. USPCAS-W at Mehran UET, Jamshoro, established with generous support of USAID Pakistan, is a state-of-the-art and modern applied national research center in water sector of the country. The Center is technically supported by the University of Utah, USA, and will be one of the world class water research centers achieving the targets successfully within the specified time frame.

The Center believes in the technological change and sustainable development through higher education, research, innovation, and outreach. The Center aims to provide the sustainable and cost-effective solutions to Pakistan's water challenges by educating the next generation of scientists, engineers and policy makers. We aim to produce quality professionals who uphold and advance for the integrity, honor, and dignity of their profession, while taking active part in the development of the society. To this end, we work very closely with students and stakeholders aiming to facilitate them in expression of their hidden potential and its utilization to avail the opportunities. Above all, the university is committed to equal opportunity and gender balance. However, according to the latest HEC ranking of the universities (2015), MUET stands as 1st in Sindh province and 6th among the public and private Engineering Universities of Pakistan. Thus, the quality and market relevance of our degree programs and the graduating students both are highly recognized at national as well as international levels. I believe the efforts and energies being utilized at USPCAS-W will certainly help in empowering the people, institutions, and researchers in the field of water and its overall management. We wish to have continuity of this high impacting project in the future. Mehran University would always keep supporting actions that benefit youth, researchers, institutions, governments, research centers, women, and the United Nations' Sustainable Development Goals (SDGs) particularly SDG 6.

**Prof. Dr. Mohammad Aslam Uqaili**

Vice Chancellor  
Mehran UET





## MESSAGE FROM UNIVERSITY OF UTAH

On behalf of the University of Utah, USA, I express warmest congratulations to Mehran University of Engineering and Technology (MUET) and the entire community of the U.S.-Pakistan Center for Advanced Studies in Water (USPCASW) for the impactful accomplishments achieved since USPCASW was funded by the United States Agency for International Development (USAID) in December of 2014. I also share our sincere gratitude for the incredible efforts of the USPCASW community that has built the international reputation of the USPCASW brand.

**USPCASW is now a leader in water research in Pakistan.** The National Water Research Agenda, 2016-2025 was developed under the guidance of USPCASW and the Pakistan Council on Research in Water Resources (PCRWR). In support of the agenda, USPCASW has funded 20 joint research projects with collaborators at the University of Utah, 28 small grant projects to researchers throughout Pakistan, and more than 130 MS student thesis research projects at MUET to address the needs for data, computer models, research infrastructure, and stakeholder impact identified through the consultation process. Using a pioneering approach, USPCASW has worked with stakeholders to co-create client-driven research projects, and in turn has secured \$2.75 million in external funding for ongoing and future initiatives. The impact of USPCASW research is tangible. Projects are supplying drinking water at MUET, safeguarding schools and hospitals from multi-drug resistant diseases, supporting industrial wastewater management in Karachi, advancing ecosystem and community restoration in the Manchar Lake, Keenjhar Lake, and Indus Delta regions, and commercializing new technologies and ventures adding to the economic development of Pakistan.

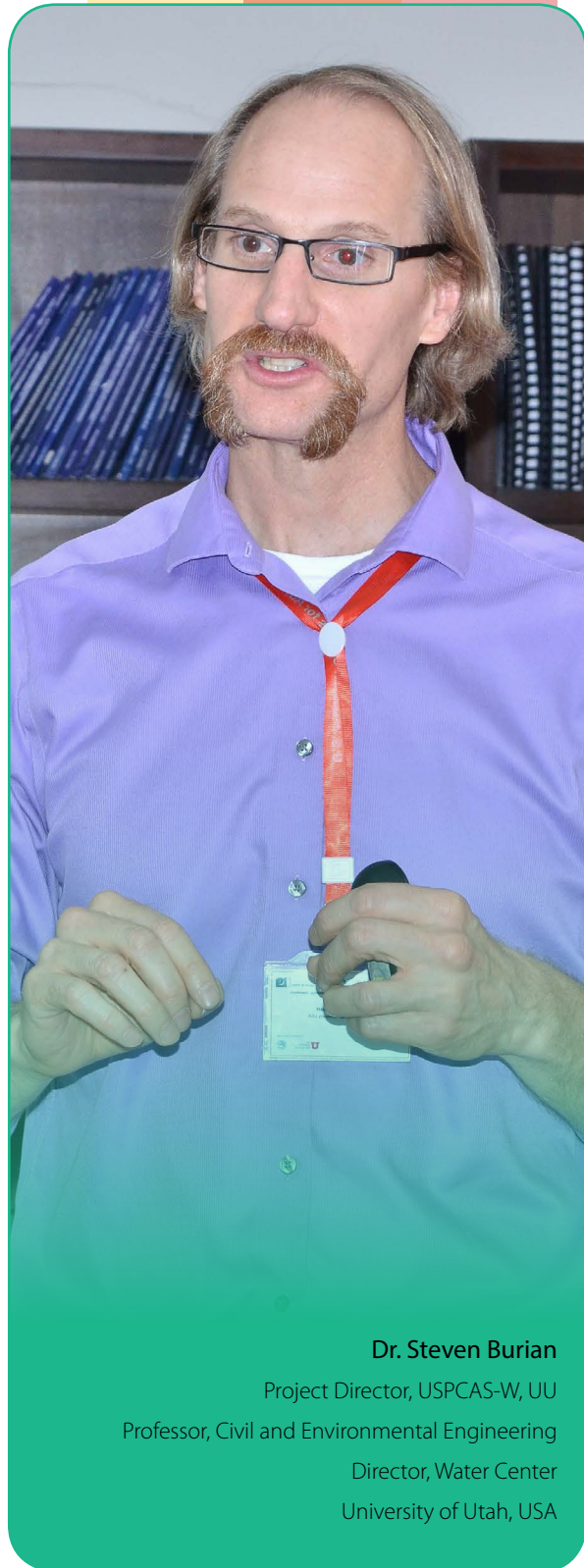
### **USPCASW is now a leader in water education in Pakistan.**

Teaming with University of Utah and other international experts, the USPCASW faculty developed seven graduate degree programs in the areas of most need to address water security in Pakistan. Those programs are supported with 32 new courses created in one-on-one collaboration with international experts in the relevant fields. USPCASW delivers the courses using the newest teaching techniques such as active learning, role playing, project-based learning, and experiential learning, much of which was learned in advanced pedagogical workshops. USPCASW impact from the educational programs is far reaching with more than 60% of the MS program graduates now working in the water sector or pursuing a PhD degree. The potential future impact of the two PhD graduates from USPCASW and those seeking PhD degrees in the U.S. is most exciting. These students are the professors of the future and will exert a long-term sustained impact on higher education quality in Pakistan.

### **USPCASW is now a leader in water training in Pakistan.**

A unique exchange program to the U.S. has trained 108 USPCASW students and faculty. In addition, international experts have contributed more than 400 person days to training USPCASW faculty, students, and staff plus the water community of practice. Many of these trainings are now established at USPCASW for delivery of programs for water sector professionals in irrigation and drainage engineering, water resources planning and management, industrial environmental engineering, and urban water supply and sanitation engineering. The impact of the exchange program has been tremendous. Those completing the exchange have advanced their research skills and most importantly their global competencies, such as confidence, communication, diverse perspectives, and expanded network. The exchange visitors have also had a significant impact on University of Utah and Colorado State University faculty and students that have hosted and interacted with the visitors. The ideas exchanged, the effort shared, and the research progress made have led to collaborative efforts sustained after the exchange, which have produced conference presentations, published journal articles, and proposals submitted for and awarded external funding.

Upon reflection, the partnership developed over the four years has endured because of mutual respect and friendship. The technical assistance from the University of Utah, USA has evolved from mentor-to-mentee relationships to mutually-beneficial collaborations. It is satisfying to see this goal come to fruition and lay the foundation for sustainability. As we enter the final stage of the USAID project funding, I am confident the partnership will be resilient. I very much look forward to celebrating USPCASW graduations and reflecting on accomplishments in 2025 and beyond.



**Dr. Steven Burian**

Project Director, USPCAS-W, UU

Professor, Civil and Environmental Engineering

Director, Water Center

University of Utah, USA

# ABBREVIATIONS

ACIAR	Australian Center for International Agriculture Research	NGO	Non- Governmental Organization
ADS	Automated Directives System	NWRN	National Water Research Network
AO	Agreement Officer	OCA	Organization Capacity Assessment
AOR	Agreement Officer’s Representative	ORIC	Office of Research, Innovation & Commercialization
BoG	Board of Governors	PCRWR	Pakistan Council for Research in Water Resources
CAS	Center for Advanced Studies	PMU	Project Management Unit
CCNY	City College of New York	PPP	Public Private Partnerships
CFR	Code of Federal Regulations	PWDR	Pakistan Water Development Report
CRP	Council for Research and Policy	PWSN	Pakistan Water Sustainability Network
CSO	Civil Society Organization	RFA	Request for Application
CSU	Colorado State University	SAU	Sindh Agriculture University
CWP	Clean Water Project	SDG	Sustainable Development Goal
	EnvEng Environmental Engineering	SEI	Stockholm Environment Institute
FAR	Faculty Annual Report	SIDA	Sindh Irrigation and Drainage Authority
FPCCI	Federation of Pakistan Chambers of Commerce & Industry	SWE	Society of Women Engineers
GDA	Global Development Alliances	SWM	Society of Water Managers
GEC	Gender Equity Committee	TVC	Technology and Venture Commercialization, U
GEP	Gender Equity Plan		
GoP	Government of Pakistan	UNESCO	United Nations Educational, Scientific and Cultural Organization
GoS	Government of Sindh	US	United States
GPE	Global Partnership for Education	USAID	United States Agency for International Development
HEC	Higher Education Commission	USG	United States Government
HESN	Higher Education Solutions Network	USPCAS	U.S.-Pakistan Center for Advanced Studies
HID	Hydraulics, Irrigation and Drainage	USPCAS-W	U.S.-Pakistan Center for Advanced Studies in Water
ICARDA	International Center for Agricultural Research in the Dry Areas	UU	University of Utah
IEE	Initial Environmental Examinations	WAPDA	Water and Power Development Authority
IWREM	Institute of Water Resources Engineering and Management	WASH	Water, Sanitation, and Health
IWRM	Integrated Water Resources Management	WaSHS	Water, Sanitation and Health Sciences
KPIs	Key Performance Indicators	WEAP	Water Evaluation and Planning
M&E	Monitoring and Evaluation	WRC	Women Resources Center
MNBSP	Merit and Needs Based Scholarship Program		
MoU	Memorandum of Understanding		
MUET	Mehran University of Engineering and Technology		

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## INTRODUCTION

U.S. - Pakistan Center for Advanced Studies in Water (USPCAS-W) has been established at Mehran University of Engineering & Technology (MUET) Jamshoro Sindh Pakistan under the Cooperative Agreement signed with USAID on December 12, 2014 for five years.



In 2012, USAID created the Higher Education Solutions Network (HESN) which emphasizes on areas of science, technology, innovation and commercialization to improve the efficacy of development. Under HESN, USAID in collaboration with HEC Pakistan launched a project "Centers for Advanced Studies – the CAS Project" under which partnerships were developed between Pakistani and U.S. universities.

The CAS project connected three U.S. universities with expertise in energy, agriculture, and water with four Pakistani universities to modernize curricula, conduct joint research, and foster student and faculty exchanges. The U.S.-Pakistan Center for Advanced Studies for Agriculture/Food Security has been set up at University of Agriculture, Faisalabad in partnership with University of California Davis, USA, Energy Centers were established at National University of Science & Technology, Islamabad and University of Engineering & Technology, Peshawar in partnership with Arizona State University,

Tempe and the the Center for Advanced Studies in Water was set-up at Mehran University of Engineering & Technology, Jamshoro in partnership with University of Utah Salt Lake City.

USPCAS-W is the state of art, modern applied and policy research center, Intent to be one of the leading centers of research excellence in water sector in Pakistan. USPCAS-W is dedicated to generate cost-effective and sustainable solutions to resolve Pakistan's water crises through applied research, developing specialist, human resource and technologies; academia-industry collaboration and policy formulation. The center aims to educate and train the next generation (future faculty, young scientists, engineers, managers and other stakeholders) to water sustainable leaders through advance academic training in different water-related disciplines.

The Center encourages and empowers women scientists and researchers to actively participate in applied research to solve Pakistan's contemporary problems.

## OVERALL GOAL

Establish a world class education and research center dedicated to solving water-related problems of Pakistan and developing a strong and productive liaison with local and international organizations that support Pakistan's economic development





## Objectives

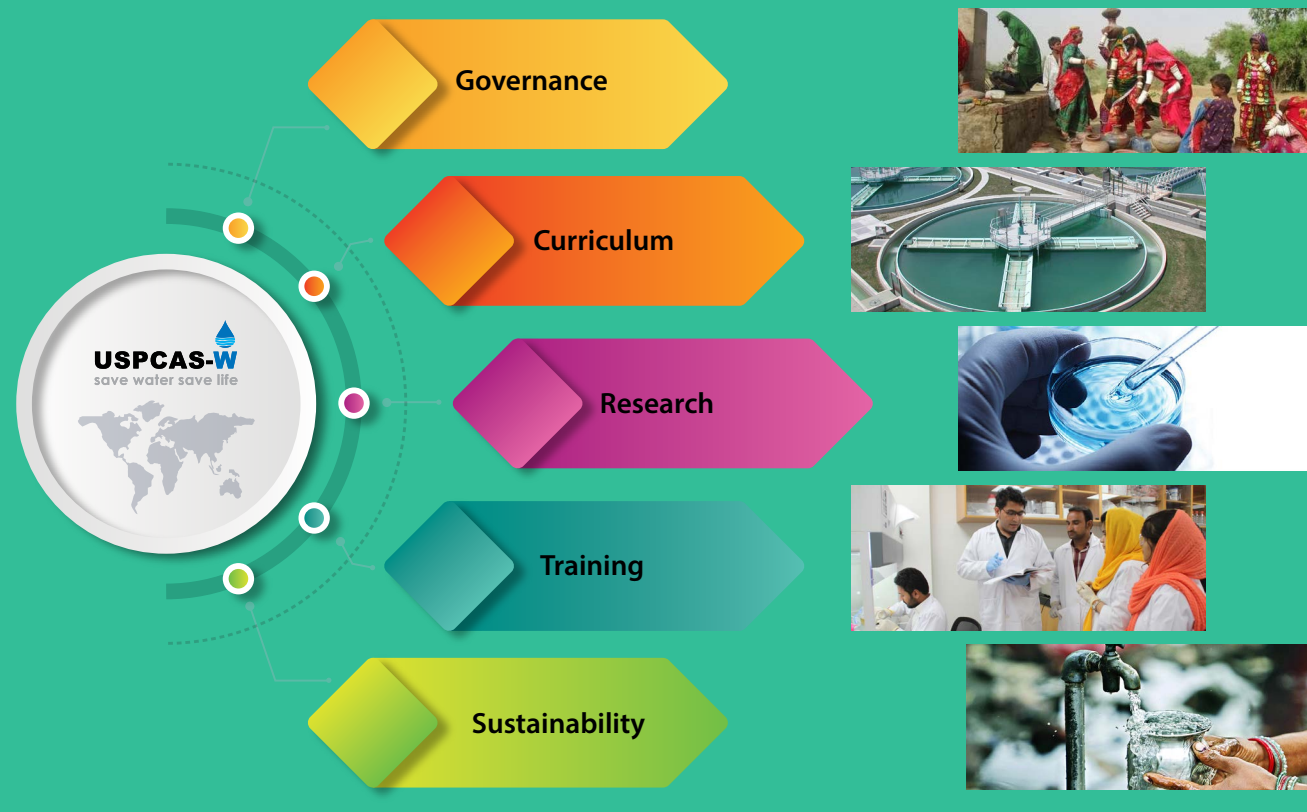
- Establish governance structures for sustainability and improved capacity of the USPCAS-W
- Improve curricula quality and strengthen use of effective teaching methods
- Apply relevant research to meet clients (industry, civil society, government) needs
- Increase access for talented and economically disadvantaged students, especially women.

## Components to achieve the objectives:

To achieve these objectives, the USPCAS-W focuses upon the following 6 main components:

1. Governance of the USPCAS-W and the Higher Education:
2. Curriculum reforms: To Provide revised curricula as well as financial management, governance, teaching, and other reforms necessary to make university education and research more relevant to the needs of industry and government.
3. High Quality Applied Research: To Construct, rehabilitate, and upgrade world-class research facilities, including laboratories, classrooms, and libraries. To Facilitate relevant policy dialogue and reforms for water sector led by the policy think tanks.
4. Graduate and Post Graduate Training: To Develop robust scholarship and exchange programs.
5. To Sustainability through Industry/Private Sector Links: Lead networking activities and develop strong links to the private sector.
6. Gender Equity: To provide equal opportunities for women and men that is different but which is considered equivalent in terms of rights, benefits, obligations and opportunities.

## VISION: Water Security of Pakistan



## US Mission Director Laid the foundation of Building USPCAS-W MUET

USAID and Government of Pakistan through the Higher Education Commission (HEC) partners to create state of the art center at MUET for advance studies of waters

Mr. John P. Groarke,  
USAID Mission Director to Pakistan



The Groundbreaking ceremony of laying the foundation of USPCAS-W building was performed by Mr. John P. Groarke the USAID Mission Director to Pakistan, and Prof. Dr. M Aslam Uqaili Vice Chancellor of Mehran University of Engineering & Technology, Jamshoro in September 2015.

## Building Inauguration



United States' looks forward to long-term commitment in strengthening Pakistan's education sector and help find practical solutions for the country's water challenges. Mission Director

Mr. Jerry Bisson, Mission Director  
United States Agency for International Development (USAID)

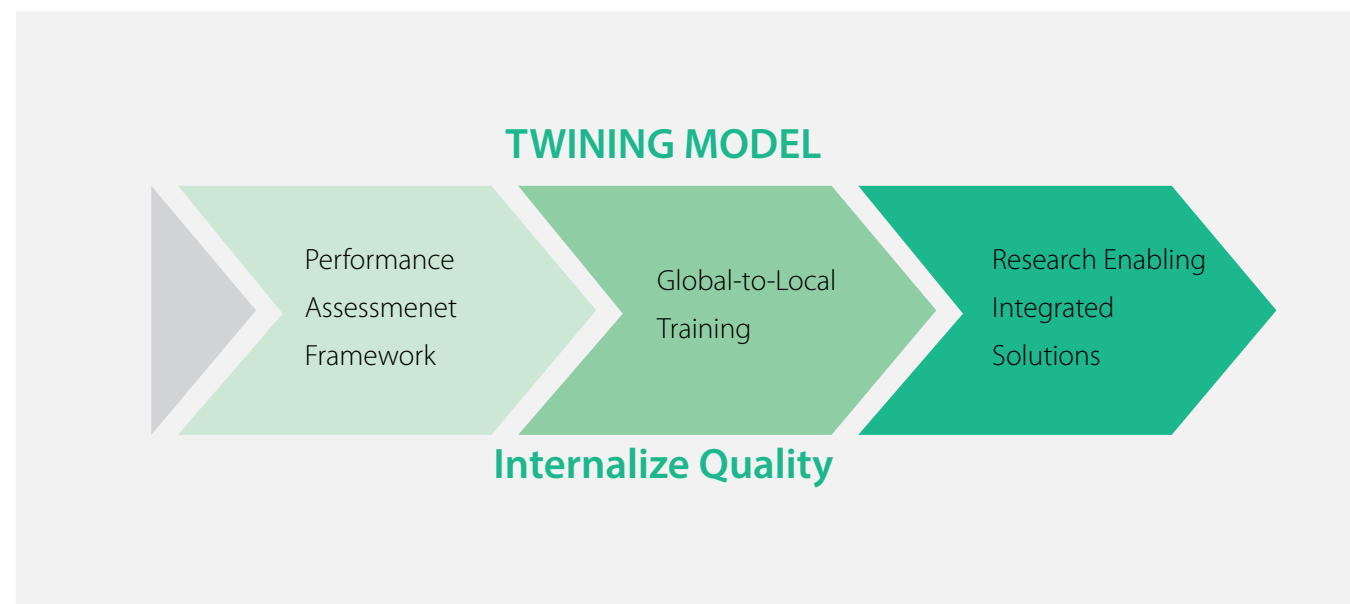
Mission Director Mr. Jerry Bisson and Deputy Mission Director Ms. Denise Herbol of United States Agency for International Development (USAID) along with Sindh Education Minister Mr. Jam Mehtab Hussain Dahar inaugurated the new building of U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W).





The University of Utah (UU), USA ([www.water.utah.edu](http://www.water.utah.edu)) has been partnered by USAID as the technical assistance partner of MUET for advancing the development and growth of USPCAS-W. The MUET-UU partnership is focused in the areas of curriculum development, applied research, training, exchanges, governance, and cross-cutting issues (gender empowerment, outreach and networking, fundraising, technology commercialization, and institutional sustainability). Under this partnership, many of the promising post graduate students and faculty have availed the opportunity of benefitting from the most modern teaching and research infrastructure and experienced faculty available at the UU. More than

50 faculty members are engaged in research on water related issues from different disciplinary perspectives, especially urban water, wastewater treatment, sanitation & health, and policy & law. Many of these faculty members are directly engaged in supporting USPCAS-W activities at MUET. The UU has also designed a Peer Teacher Partnering Program – the Twining Model, to train the faculty members of MUET. It connects MUET faculty to UU faculty for seeking support in the design and delivery of courses and research projects. As a part of MUET-UU partnership, faculty as well as students go for exchange training to UU and other partnering institutions.



## GOVERNANCE



The Center is governed through the Board of Governors (BoGs) and benefits from the advisory role of the Senior Advisory Board (SAB) from University of Utah, USA. With the support of Project Management Unit (PMU), different committees are formed. The committees ensure the smooth performance, administration and management of the Center.

### Committees of the Center to Perform Specific Functions:

1. Selection Board Committee
2. Curriculum Review Committee
3. Admission Committee
4. Procurement Committee
5. Research Grants Management Committee
6. Students Research Grant Committee
7. Gender Equity Committee
8. Endowment Fund Committee
9. Senior Advisory Board (University of Utah)
10. Standing Committee on Business-Academia Collaboration on Water (SCBAC-W)

BoG

The Board of the center has been constituted in a manner that it strengthens the linkage with private sector and industry and also advice on improving the Center's governance. The board meets bi-annually.



**Prof. Dr. M. Aslam Uqaili**  
Vice Chancellor, MUET  
Chairman, BoG





**Dr. Mujeeb-ud-din Memon**  
Vice Chancellor  
S.A.U, Tando Jam | Member, BoG



**Dr. M. Jamal Khan**  
Vice Chancellor University of Swat  
Member, BoG



**Senator Nisar A. Memon**  
Chairman Water Environment Forum  
Member, BoG



**Dr. Muhammad Ashraf**  
Chairman Pakistan Council of Research in  
Water Resources | Member, BoG



**Ms. Khawar Mumtaz**  
Chairperson National Commission on  
the Status of Women | Member, BoG



**Dr. Tauha Hussain Ali**  
Pro - Vice Chancellor MUET  
Member, BoG



**Dr. Arjumand Nizami**  
Country Director Inter-cooperation  
Pakistan | Member, BoG



**Dr. Abubakr Muhammad**  
Director Center for Water Informatics  
Technology, LUMS, Lahore | Member, BoG



**Dr. Khan Muhammad Brohi**  
Dean Faculty of A&CE, MEUT  
Member, BoG



**Dr. Abdul Waheed Umrani**  
Registrar MUET  
Member, BoG



**Mr. Munir Ahmed Shaikh**  
Director Finance MUET  
Member, BoG



**Prof. Dr. Bakhshal Lashari**  
Project Director USPCAS-W  
Secretary, BoG

## Project Management Unit

The Project Management Unit (PMU) has been established within MUET for smooth functioning of the center for the five year project period. PMU is responsible to monitor project implementation within timeline, review performance and actively pursue fund raising activities. A few team members of University of Utah PMU are also based at MUET.

MUET and UU PMUs are comprised of following five key personnel:

### PMU-MUET



**Dr. Bakhshal Lashari**  
Project Director



**Dr. Rasool Bux Mahar**  
Deputy PD, (Academics & Research)



**Mr. Shahid Panhwar**  
Monitoring and Evaluation Specialist



**Mr. Mansoor A. Shah**  
Finance and Grants Manager



**Mr. Shakil A. Sheikh**  
Director Administration

### PMU-UU



**Dr. Steve Burian**  
Project Director



**Dr. M. Aslam Chaudhry**  
Chief of Party



**Dr. Jeffrey Ullman**  
Technical advisor (Present)



**Dr. Sajjad Ahmad**  
Technical advisor (2016)

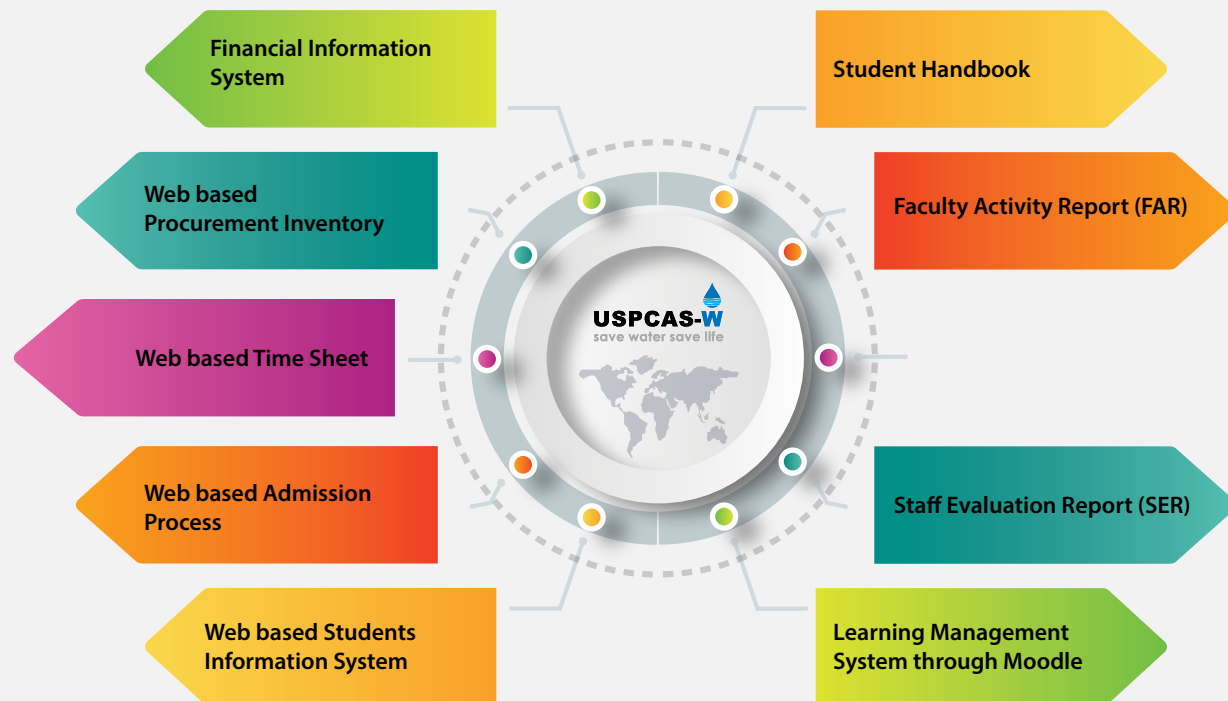


**Dr. Mercedes Ward**  
M&E Specialist



## Institutional Systems Established by the Center

For effective performance, the center has established following institutional systems:



## Institutional Development

The theory of change driving the approach to institutional development at USPCAS-W draws on ideas developed by Forum for the Future, and others about the importance of human, social, manufactured (physical), financial, and natural capital for sustainable development. At USPCAS-W, capacity building activities focus on increasing human, social, physical, and financial capital in order to create a Center with enough capital stocks across all four types to continue, post-USAID funding, to advance the Water SDG agenda in Pakistan, thereby increasing Pakistan's natural capital.

**Human capital** generating activities include degree programs, training workshops, and exchange programs to develop faculty and student capacities across both technical and soft skills.

**Social capital** generating activities include networking events, such as executive seminars, that bring together key stakeholders from academia, government, business, and civil society.

**Physical capital** generating activities include the construction of a new building to house the Center at MUET, along with the establishment of labs and libraries.

**Financial capital** generating activities include external grant writing, collaborations with the private sector, and fee-based workshops for water professionals seeking additional training.

In many ways, however, human capital development in terms of developing the Center's endogenous capacity to increase the four capitals is the most fundamental element of this project because social, manufactured, and financial capital are ultimately derivatives of human and/or natural capital.

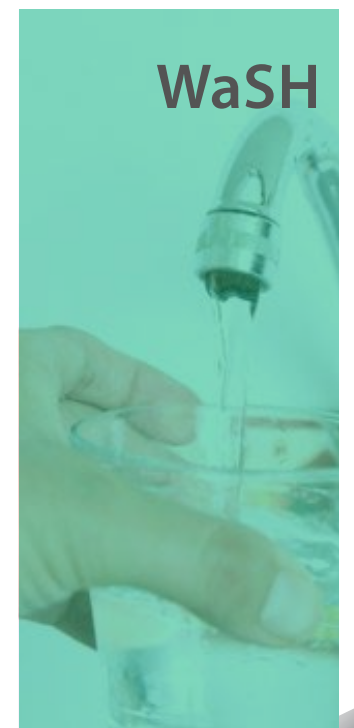
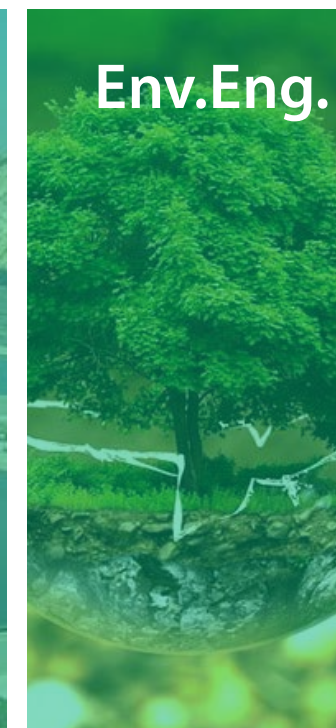
## ACADEMIC PROGRAM AND CURRICULUM

### DEGREE PROGRAMS

The Academic program of the center trains and graduates Masters and Ph.D. students to create a vital work force to address the critical issues of water in following four themes.



- ☐ **Hydraulics, Irrigation, and Drainage (HID)**
- ☐ **Integrated Water Resources Management (IWRM)**
- ☐ **Environmental Engineering (Env.eng)**
- ☐ **Water Sanitation and Health Sciences (WaSH) (MS only)**





### Hydraulics, Irrigation, and Drainage (HID)

The HID program educates students in the field of open channel and groundwater hydraulics in combination with engineering principles and to support useful plant life, with minimum degradation of soil and water resources. HID program, especially at the postgraduate level, is structured to be interdisciplinary. Students get encouraged to explore and appreciate environmental and ecological effects of irrigated agriculture.



### Environmental Engineering (Env.EnG)

The Env.Eng program focuses on the fundamental and applied understanding of the processes which govern natural and engineered treatment systems and the affects that they have on human and ecosystem health. This program emphasizes learning in conventional environmental engineering, physical, chemical and biological processes, water quality management, water and wastewater treatment design, air and noise pollution control, hazardous and solid waste management, and environmental impact assessment.



### Water, Sanitation and Health Sciences (WaSH)

This program deals with the skills and knowledge to effectively implement water and sanitation interventions and work with community and community-based organizations and the local political structure. It assess the functioning and impacts of these systems, and implement solutions to improve the effectiveness and sustainability of existing systems.

### Admissions

Mandate of Center is to enroll the diverse students from all over Pakistan including Gilgit Baltistan and Azad Kashmir. The Admissions in Center are open to all candidates and the selection is on merit. Since Center believes in transparency and merit so the admissions are made through an entry test at five different centers across the country. The test is conducted at following centers:

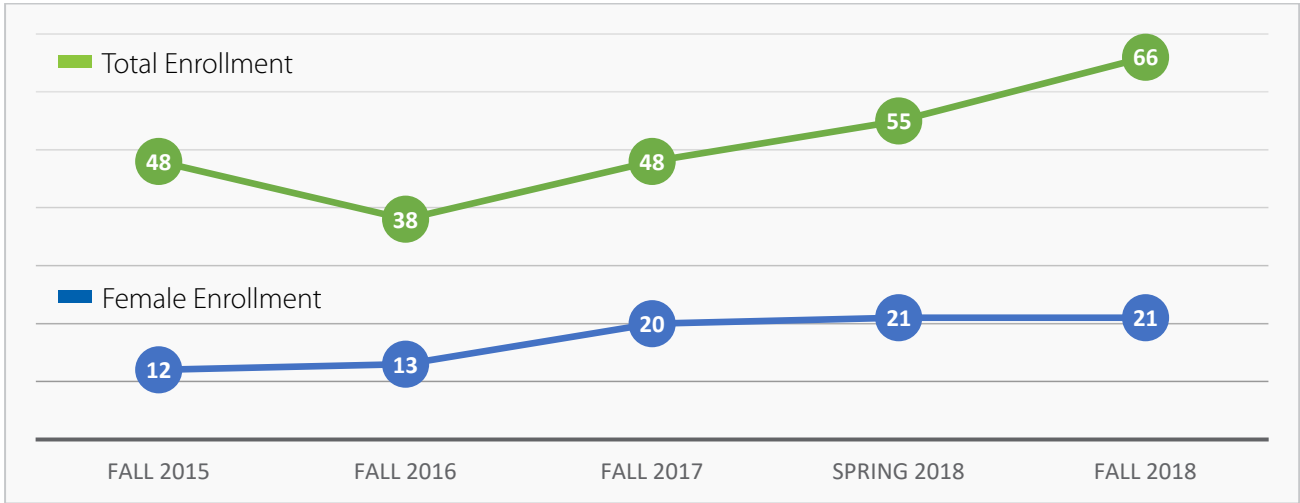
- Pakistan Scientific & Technological Information Center (PASTIC), Quaid-e-Azam University, Islamabad
- New Academic Block, U.S.-Pakistan Center for Advanced Studies in Energy (USPCAS-E), University of Engineering & Technology (UET), Peshawar
- Department of Agriculture Engineering, Bahauddin Zakariya University, Multan
- Water Resource Research Center (WRRC) at Balochistan University of Information Technology, Engineering & Management Sciences (BUITEMS) Takatu Campus, Quetta
- USPCAS-W at MUET, Jamshoro

### Admissions and Enrollment

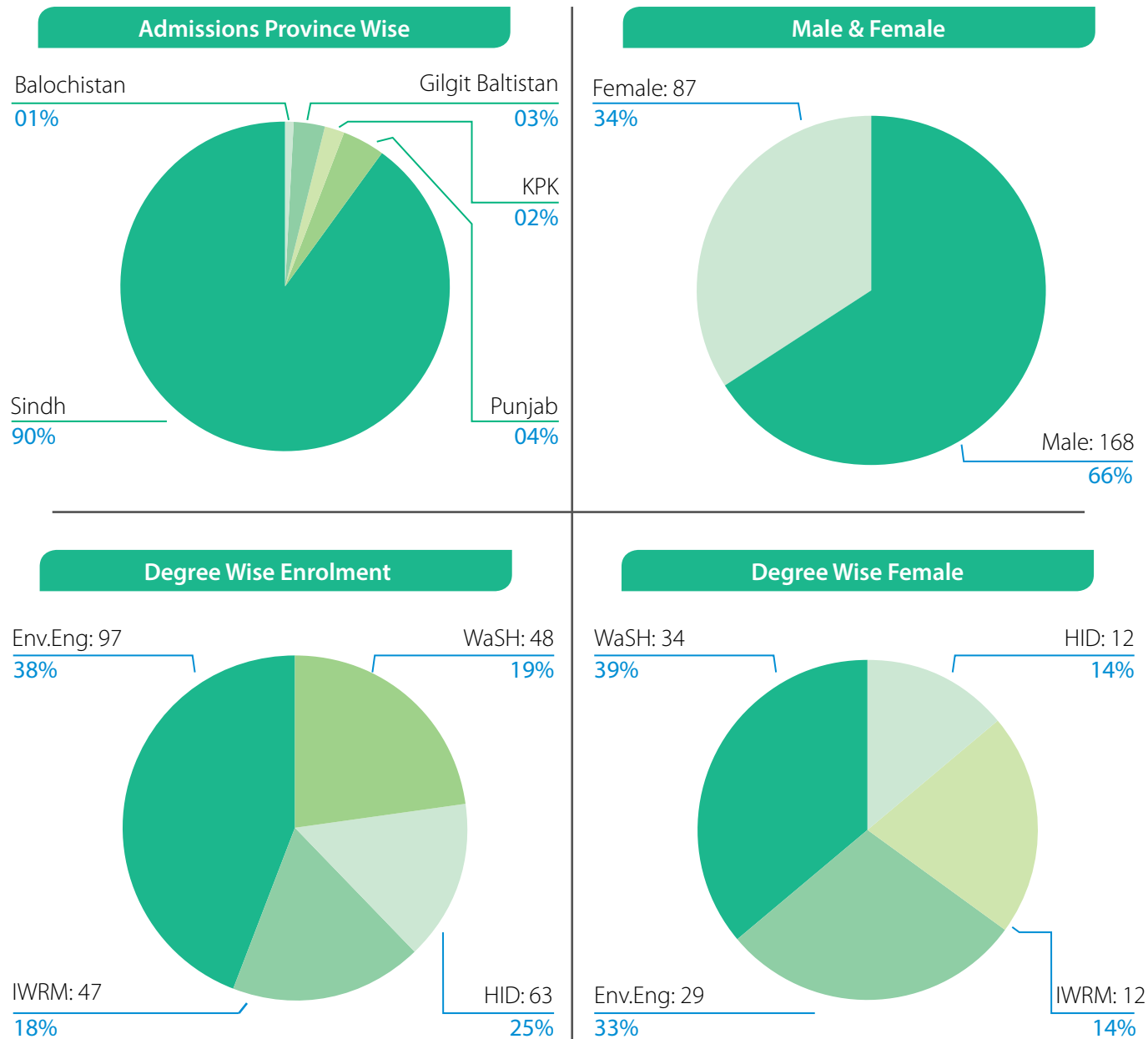
Until 2018 fall, five batches have been enrolled in MS and PhD programs. The total number of enrolled students since fall 2015 batch untill fall 2018 batch Stand as 255 comprised of 242 MS and 21 PhD. scholars including 87 (34%) female students.

Total Students	Fall 2015	Fall 2016	Fall 2017	Spring 2018	Fall 2018	Total Enrollment
Female	12	13	20	21	21	87
Male	36	25	28	34	45	168
Total	48	38	48	55	66	255
PhD Students						
Female	1	-	-	2	-	3
Male	9	-	4	4	-	17
Total	10	-	4	6	-	20
MS Students						
Female	11	13	20	19	21	84
Male	27	25	24	30	45	151
Total	38	38	44	49	66	235

### Batch Wise Enrollment Trend







## Scholarship and Benefits

For the first five years of the program, the center provides following benefits to the students, enrolled in the center:

Full tuition fee for all semesters

- (4 semesters for MS students and 6 semesters for PhD students)
- A stipend of Rs.15,000 per month to cover living and accommodation costs
- Free transport through university buses
- Training and research opportunity at Universities in USA
- Female students are provided free accommodation at the campus.

## Curriculum Reform

The curriculum reform process involves MUET faculty and USPCAS-W staff with input from Higher Education Commission (HEC) Pakistan, the University of Utah and other partnering university and other stakeholders including; academia, government, civil society and industry. It is one of the main components of the center to bring a range of reforms through brainstorming sessions in seminars and workshops to align curriculum with the market needs and applied learning. The reforms also strengthen the relevance and quality of the coursework. The center has designed and improved about 32 courses for seven degree programs with the support of partnering universities of USA which includes University of Utah, Colorado State University, University of Nevada, Los Vegas and City University of New York.





## USPCAS-W Faculty Profiles



### Dr. Bakhshal Lashari

PhD (Poland); Post-doc Under Fulbright and Endeavour Australia Program)

Expertise: hydrology, irrigation, drainage, water resources management, water conservation



### Dr. M. Munir Babar

PhD (Japan); Post-doc (USA)

Expertise: open channel hydraulics, design of hydraulic structures, energy dissipaters and stilling basin, and computer modeling of open channels and groundwater flows using FEM techniques.



### Mr. Muhammad Ali

MS (Japan)

Expertise: public policy, economics, monitoring and evaluation, networking



### Ms. Uzma Imran

MS (Pakistan)

Expertise: Environmental Impact Assessment, environmental laws & management plans and stakeholder consultation.



### Dr. Abdul Latif Qureshi

PhD (Mehran University)

Expertise: water resources planning, optimization of water resources, surface water hydrology



### Dr. Rasool Bux Mahar

PhD (China), Post-Doc (USA)

Expertise: Identification and Characterization of antibiotic resistant bacteria and their disinfection, water and waste treatment design, removal of metals from water through nano-fibers, solid waste treatment, anaerobic digestion and kinetic modeling.



### Mr. Waqas Ahmed

M.Sc. (Germany)

Expertise: GIS and remotesensing, marine ecosystems, hydromechanics, water resource engineering.



### Dr. Jamil Ahmed

MBBS, MPH, M.Phil. in International Health (Norway)

Expertise: Public Health in general, mother and child health & water sanitation & hygiene in particular



### Dr. Kamran Ansari

PhD (UK)

Expertise: Open channel hydraulics, hydrology, water resources engineering, irrigation and drainage.



### Dr. Altaf Ali Siyal

PhD (UK); Post-doc (USA and Endeavour Research Fellowship Program Australia)

Expertise: Soil waterlogging and salinity, irrigation water management, groundwater, soil and water conservation, GIS and remote sensing.



### Ms. Rakhshinda Bano

M.Sc. (USA)

Expertise: Wetlands conservation, water management, environmental economics, and sustainable development.



### Dr. Asmat Ullah

PhD (Thailand)

Expertise: Water & carbon footprint analysis, sustainability & eco-efficiency analysis, agricultural water productivity assessment and integrated water resources management.



### Dr. Zubair Ahmed

PhD and Post-doc (South Korea)

Expertise: Wastewater treatment, application of membrane bioreactors for nutrient removal, anaerobic digestion, physio-chemical treatment of water & wastewater.



### Dr. Arjumand Zaidi

PhD (USA)

Expertise: Environmental evaluation and decision making, optimization and modeling of water resources, environmental and disaster management systems, and Geographical Information Systems (GIS) using satellite data.



### Dr. Naveed Ahmed

PhD and Post-doc (South Korea)

Expertise: Biosensor development, toxicity assessment, sulfur-oxidizing bacteria, struvite recovery from swine wastewater, anaerobic digestion, and sulfur-utilized denitrification of groundwater.



### Dr. Muhammad Rizwan

Ph.D. (South Korea)

Expertise: Biofuel production and wastewater treatment.



### Dr. Syed Sara Hassan

PhD (Pakistan)

Expertise: chemistry, water quality, Water, Sanitation and Health (WaSH)



### Mr. Ghulam Hussain Dars

M.S. (USA)

Expertise: Hydrology, climate change impact analysis, flood modeling, water resources engineering, water quality, GIS, project planning, IWRM



### Dr. Ayesha Tajammul

PhD (Pakistan)

Expertise: Nanomedicine, environmental medicine, bioremediation of environmental pollutants, environmental and health risk assessment, molecular and cell biology, immunohistochemistry and Microscopy.



### Mr. Tanveer Ahmed Gadhi

PhD (Italy)

Expertise: Design and development of nano materials for environmental applications.



Following is the Faculty from University of Utah and Colorado state university which are engaged with center’s teaching research and capacity building programs. These professors also visit MUET and impart extensive trainings in the areas of teaching, research and hands-on trainings for lab equipment.



**Dr. Steve Burian**  
Professor  
Utah University, USA



**Dr. Tariq Banuri**  
Professor  
Utah University, USA



**Dr. M. Aslam Chaudhry**  
Professor  
Utah University, USA



**Dr. Krista Carlson**  
Utah University, USA



**Dr. Jennifer Weidhaas**  
Professor  
Utah University, USA



**Dr. Jim VanDerslice**  
Professor  
Utah University, USA



**Dr. Christine Pomeroy**  
Professor  
Utah University, USA



**Dr. Mike Barber**  
Professor  
Utah University, USA



**Dr. Mark Halle**  
Professor  
Utah University, USA



**Dr. Maya Silaver**  
Utah University, USA



**Dr. Pat Shea**  
Professor  
Utah University, USA



**Dr. Lowell Scott Benson**  
Professor  
Utah University, USA



**Dr. Joshua Val Garn**  
Utah Nevada, Reno, USA



**Dr. Sajjad Ahmad**  
Professor  
University of Nevada, USA



**Prof. Jose Chavez**  
Professor  
Colorado State University, USA



**Prof. Allan Andales**  
Professor  
Colorado State University, USA



**Prof. Tim Gates**  
Professor  
Colorado State University, USA

# RESEARCH PROGRAM



The center is targeting contribution towards achieving the Sustainable Development Goal-6 “Ensure availability and sustainable management of water and sanitation for all” by carrying out research as prioritized under the set water research agenda.

One of the key objectives of the Center is to develop and implement a self-sustaining applied research program in water. The goal of the center’s research program is to stimulate competitive and innovative applied research. It is multi-disciplinary in nature and developed within the broader context of the water-development nexus to support the achievement of sustainable development goal on water (SDG-6). Achieving this aim, the water research agenda was developed and prioritized through consultative process with the participation of relevant private sector and government stakeholders to ensure relevance and attract private sector funding for advanced research in water issues.

The Center advances water research capacity and impact in Pakistan with a sustainable, high-impact applied research program that bridges expertise among USPCAS-W and other researchers & practitioners.

Applied research agenda includes;

- Overcoming water scarcity
- Developing and maintaining water infrastructure
- Improving water quality
- Improving water use efficiency and agricultural productivity
- Enhancing access to drinking water and sanitation
- Bridging disparities in access and coverage
- Reversing groundwater depletion
- Reclaiming degraded lands
- Strengthening water governance
- Improving performance of water utilities
- Protecting water ecosystems



Research Infrastructure

The center’s infrastructure fulfils all the needs of modern research. The infrastructure includes a highly qualified faculty, fully equipped library and state of the art laboratories.

In total 20 faculty members of the center, 16 are PhDs and others are enrolled in PhD programs.

The center has established 6 laboratories fully equipped with modern equipment, software and other accessories.

Research Laboratories



Soil and water analysis Laboratory



Advanced Water and Wastewater Quality Control Laboratory



Hydraulics Laboratory



Pilot Scale Water and Wastewater Treatment laboratory



GIS and Remote Sensing Laboratory



Computer and Software Laboratory

Research Projects

In pursuance of the water research agenda, the center has initiated 46 projects. This include 30 projects of approximately Rs. 89 million for which the center has awarded seed grants to its faculty & researchers of other academic institutes of the country. Moreover; the center is also doing 16 client-driven and donor-funded projects amounting Rs. 131 million.

USPCAS-W Funded Project

No	Title of Project	Lead Institution	Name of PI
1	Assessment of Environmental Degradation of Manchar Lake	PCRWR, Islamabad	Engr. Zamir Ahmed Soomro
2	Decision Support System for Water Resources Planning and Management	USPCAS-W, MUET	Mr. Waqas Ahmed
3	Climate Change: Assessing Impact of Seawater Intrusion on Soil, Water & Environment in Indus delta using GIS & Remote Sensing	USPCAS-W, MUET	Dr. Altaf Ali Siyal
4	Managing Uncertainties in Projected Impacts of Climate Change on Precipitation Patterns in the Indus Basin, Pakistan	USPCAS-W, MUET	Mr. Ghulam Hussain Dars
5	Water Conservation and Mitigation of Arsenic in Rice through Sprinkler Irrigation System	Dept.of Environ. Science, QAU Islamabad	Dr. Abida Farooqi, Dr. Asif Javaid
6	Identification of Antibiotic Resistant Bacteria in Different Source of Waters in Hyderabad City and its Surroundings	USPCAS-W, MUET	Dr. R B Mahar
7	Changing Climate in Pakistan: Food Security and Water Management Implications	USPCAS-W, MUET	Mr. Ghulam Hussain Dars
8	Assessing Effectiveness of Linear Anionic Polyacrylamide (LA-PAM) to Reduce Seepage Losses in Unlined Canals	USPCAS-W, MUET	Dr. M. Munir Babar
9	Crop Water Productivity Assessment of Major Cropping Systems in Sindh and Punjab	USPCAS-W, MUET	Dr. Asmatullah
10	Keenjhar Lake Water Quality Assessment and Valuing Ecosystems Services (KL-WAVES)	USPCAS-W, MUET	Ms. Uzma Imran
11	Monitoring Seawater Intrusion in the Indus Delta for Climate Change Adaptation	PCRWR, Islamabad	Dr. Ashfaq Shaikh
12	Assessment of water, sanitation and hygiene services in primary schools of Sindh	USPCAS-W, MUET	Dr. Jameel Soomro
13	Use of Multi-Level Remote Sensing to Evaluate Salinity on Irrigated Lands	USPCAS-W, MUET	Dr. Altaf Ali Siyal
14	Isolation and Characterization of Antimicrobial Resistant Water Contaminant and Bacteriophage Remedy to Improve Water Quality	Panjwani Center For Molecular Medicine and Drug Research (PCMD), Karachi	Dr. Ayaz Ahmed



No	Title of Project	Lead Institution	Name of PI
15	Integrating water sanitation and hygiene indicators into the National Health Information System in healthcare facilities of Pakistan: the use of this novel tool in a cluster randomized trial.	USPCAS-W, MUET and University of Nevada	Dr. Jamil Ahmed
16	Eco-innovation in textile processing industry of KITE for sustainable product processing	USPCAS-W, MUET	Dr. Zubair Ahmed
17	Production of drinking water from Indus River through Canal bank filtration for Mehran University Jamshoro: Estimation of yield, pumping requirements, bioclogging, and characterization of water quality	USPCAS-W, MUET	Dr. Zubair Ahmed
18	Indus River Water Level Monitoring in Sindh using Satellite Radar Altimetry	USPCAS-W, MUET & Sindh Irrigation Dept.	Dr. Arjumand Zaidi
19	2D Materials Design and Discovery in Water Treatment	ICCBS, University of Karachi	Dr. Ghulam Mustafa
20	Simulation Modeling and Analysis of Household Water Consumption in Pakistan using Hybrid Approach	NUST, Islamabad	Dr. Imran Mehmood
21	Improved Hydro meteorological forecast under changing climate by using robust modelling techniques	USPCAS-W, MUET & University of Utah	Mr. Ghulam Hussain Dars
22	Assessment of sediment pollution in a diverse (Goi Nala) catchment of River Jhelum, Azad Jammu and Kashmir	The University of Poonch, Rawalkot	Dr. Mohsin Zafar
23	Multifunctional nanocomposite membranes for wastewater treatment	COMSATS Institute of Information Technology, Islamabad	Dr. Farha Masood
24	Governance and Civic Capacity for the Provision of Drinking Water in Urban Sindh	NUST, Islamabad and University of Delaware, USA	Ms. Maha Ahmed
25	Estimating Sustainability Cost of Urban Water Supply for Hyderabad City, Sindh, Pakistan	USPCAS-W, MUET	Ms. Rakhshinda
26	Wastewater Treatment and Reuse to approach zero water discharge in Al-Rahim Textile industries: substantial increase water use efficiency in Textile processing	USPCAS-W, MUET and Al-Rahim Textile Industry, Karachi	Dr. Tanveer Ahmed Gadhi
27	Closed-loop secondary-level canal monitoring for equitable and reliable distribution of water	USPCAS-W, MUET, SIDA and University of Utah	Dr. Abdul Latif Qureshi
28	Treatment and reuse of wastewater of fish processing industry	USPCAS-W, MUET + Fishery Industry & UU	Dr. Zubair Ahmed
29	Baseline and Impact Assessment of ABAD Project Area	National Rural Support Program	Muhammad Tahir Wakar
30	Assessing relevance of CAS-W program outputs to Sector/Industry needs	USPCAS-W, MUET, UU & Ipsos Pakistan	Abdul Sattar Babar

## Donor Funded Projects

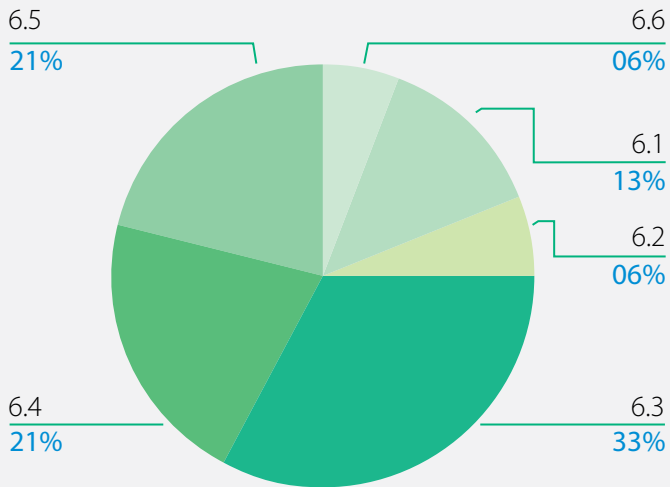
No	Title of Project	Sponsor	Project Lead
1	Identifying the likely impacts of coal combustion residues from Thar coal-fired power plant on the Region's ecosystem	HEINRICH BOLL STIFTUNG	Dr. R.B Mahar
2	Sustainable Fresh Groundwater Management for Irrigated Agriculture in Lower Indus Basin (LIB) using PMWIN model	HEC	Dr. Abdul Latif Qureshi
3	Improving groundwater management to enhance Agriculture and farming livelihood in Pakistan	ACIAR	Dr. Abdul Latif Qureshi
4	Diffusion and adoption through partnerships and action of the best watershed rehabilitation and irrigation practices and technologies to help rural farmers -Phase-II	ICARDA/USDA	Dr. Abdul Latif Qureshi
5	Capacity Building at MUET, Jamshoro to address drinking water issues in Pakistan	US-Pak (HEC)	Dr. R.B Mahar
6	Optimization of anaerobic digestion process using codigestion of crop residues and buffalo dung	HEC	Dr. R.B Mahar
7	Efficient participatory irrigation institutions to support productive and sustainable agriculture in South Asia.	ACIAR	Dr. Bakhshal Lashari
8	CAPACITY BUILDING OF THE OFFICERS / OFFICIALS OF SINDH IRRIGATION DEPARTMENT	Sindh Irrigation Department	Dr. Bakhshal Lashari
9	Role and loss of biodiversity: implications for local community of hangu district, kpk	HEC	Dr. Asmatullah
10	Baseline Survey of Existing WaSh Conditions in Thatta City (Ward No. 3)	NRSP	Muhammad Ali
11	Proposal for Rehabilitation of sewage treatment plant (STP) installed at Niamat gas Field, United Energy Pakistan limited	UEPL	Dr. R.B Mahar
12	Smart groundwater monitoring for sustainable groundwater extraction in Sindh	NRPU-HEC	Waqas Ahmed
13	Situation Analysis of Waste Management at processing facilities of United Energy Pakistan (UEP)	UEPL	Dr. Zubair Ahmed Dr. R.B Mahar
14	Impact of Climate Change in the Indus River Delta and Coastal Region of Pakistan	GCISC	Altaf Ali Siyal
15	The Impact of Informal Institutions on Participatory Irrigation Management Outcomes	WISP, MUET and UU	Dr. Mercedes Ward
16	An Integrated Development Plan for the Barani Areas of Punjab (ABAD)	ABAD Punjab, MUET, UU	

## USPCAS-W Research and SDG 6

All research projects initiated by the center in collaboration with various partner organizations are contributing towards achieving the SDG-6 targets.

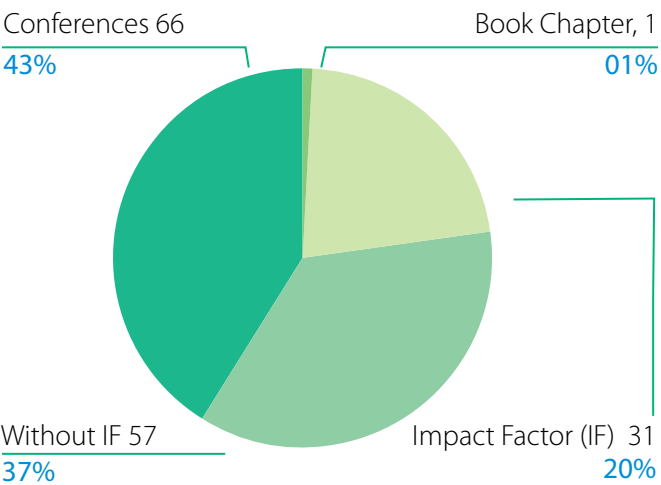
### SDG-6 Targets and Center's Contribution

- 6.1 Drinking water
- 6.2 Sanitation and hygiene
- 6.3 Improve water quality
- 6.4 Water-use efficiency
- 6.5 Integrated water resources management
- 6.6 Water-related ecosystems



### Research Publications

Students and faculty of the center are disseminating their research work and publishing that in various national and international conference and journals.



### National Water Research Network (NWRN)

In order to deal with water sector challenges, the center has also established a think tank called "National Water Research Network (NWRN)". NWRN serves as an important platform for developing shared understanding of water sector agenda, supporting the achievement of water Sustainable Development Goal No. 6 and sharing of knowledge to best practices for capacity building of water sector professionals.

## CAPACITY BUILDING



### Students and Faculty Capacity Building

The center broadens the perspective and enhances the capability of water professionals in Pakistan. The central element of the exchanges and training programs is the Peer Teacher Partnering (PTP) program to link USPCAS-W faculty with UU faculty to support the design & delivery of courses and enhance applied research techniques.

Atleast thrice a year, UaU Mission comprising of experts from the USA partnering universities visits the Center to conduct the trainings and workshops.

Many of the transnational training programs are designed to train the MUET personals and students with the support of USPCAS-W, UU.

One of the key accomplishments is the establishment of an integrated mentoring and training program for MUET faculty. This program includes development and delivery of an effective teaching workshop and an active

teaching boot camp. These activities help demonstrate the range of activities necessary for a high-tier research institution.

The boot camp in particular is found to be an incredibly effective tool for both of those offering workshops and the attendees. By working around a theme over the course of the week, more material is covered in a way that most of the participants are connected with each other. Moreover, Discussions are also held to replicate the experience for future faculty.

In addition to the trainings, mentors from the University of Utah and other partner institutions support MUET faculty in the development and delivery of their courses. The Center also offers personal attention in developing other necessary skills in writing and research. Every single course offered is paired with a mentor with the goal of providing a certified course.



University of Utah Missions – An Overview

The missions comprised of Professors from the University of Utah, Colorado State Univeristy and University of Nevada USA have conducted following theme specific focussed trainings in the last four years.

Month & Theme	Training Workshops
December 2018	<div>□ Workshop: Experimental Design</div>
Improving Quality of Research	<div>□ Workshop: Mentoring Graduate Student Writing</div>
July 2018	<div>□ Faculty Performance Evaluation Process</div>
Sustaining Processes and Practices of USPCASW	<div>□ Workshop: Proposal Review and Critique</div> <div>□ WASH-Focused Training</div>
May 2018	<div>□ Workshop: Applied Statistics for Research</div> <div>□ Workshop: Research Proposal Development</div>
Improving Research with Attention to Detail	
December 2017	<div>□ Workshop: Research Mentoring</div> <div>□ Workshop: Modernizing the Curriculum</div> <div>□ Workshop: Communicating Research Results</div>
Taking the Next Step	
July-August 2017	<div>□ Collaborative Research Development Workshop on Water Water Efficiency, IWRM, WASH and Environmental Engineering</div> <div>□ Human Subjects Research Workshop</div>
Building Collaborative Research Partnerships	
May 2017	<div>□ Climate Vulnerability Assessment and Adaptation of Water Systems Workshop</div> <div>□ Flipped Classroom Workshop</div> <div>□ Graduate Student Development Workshop</div>
Innovation for Impact	
December 2016	<div>□ Research Collaboration Workshop</div> <div>□ Grant Writing Workshop</div> <div>□ Teaching Workshop</div> <div>□ Graduate Student Workshop</div> <div>□ Technical Training Workshop – Community Engaged Research</div>
Building a Collaborative Water Centers Network	
July 2016	<div>□ Effective Teaching Workshop</div> <div>□ Research Coordination Workshop</div> <div>□ Graduate Students Workshop</div>
May 2016	<div>□ Brainstorming meeting on status of water data in Pakistan</div> <div>□ Curriculum reform review and streamlining</div> <div>□ Boot camp on research data management and analysis</div>
December 2015	<div>□ Faculty Evaluation: Teaching, Research, Service</div> <div>□ Graduate Student Workshop</div> <div>□ Entrepreneurship &amp; TVC Workshop</div>
Faculty Workshops and Boot Camps	

Month & Theme	Training Workshops
July-August 2015	<div>□ Systems Modeling + Stella training</div> <div>□ WEAP Training (SEI)</div> <div>□ Advancing Research with Curriculum – program review</div> <div>□ Linking Teaching to Research – discussion</div> <div>□ Stimulating Gender Equity Through Research – discussion</div> <div>□ Water Quality and Climate (WaQC) Workshop</div> <div>□ Grant Writing Workshop</div> <div>□ TVC group meeting</div>
May-June 2015	<div>□ Curriculum development workshop</div> <div>□ Governance and M&amp;E Workshop</div> <div>□ Innovative teaching workshop</div> <div>□ Gender workshop</div>







## Exchange Training Program

The central element of the exchanges and training program brings water experts, faculty and students from Pakistan to study at partner universities in the U.S. This offers opportunities to faculty and students to work with other relevant institutions.

The beneficiaries of the exchange program either faculty or students help in establishing strong peer-to-peer linkages through joint research project and publications. Moreover, the mechanism of exchange program leads to long term relationship and future collaborative

opportunities. The Center collaborates with the US Partner Universities in order to facilitate transfer of knowledge, improve quality of academic programs, applied research projects, provide synergies in research and develop an international outlook for the Center.

The Center has framed an excellent exchange program for the faculty and students at partner Universities in USA i.e University of Utah and Colorado State University. So far, 109 individuals including faculty and students have been benefitted from this program.

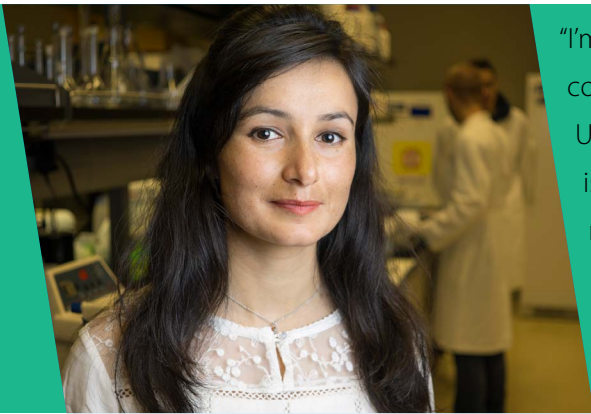
Description	No. of Participants
<b>Female</b>	<b>45</b>
Faculty	3
Students	42
<b>Male</b>	<b>87</b>
Faculty	13
Staff	2
Students	72
Grand Total	132



## Student Exchange Experiences

"I am thankful to USAID for providing me a wonderful exchange opportunity to visit the University of Utah (UU), USA. When I arrived at Utah, I struggled with the American Accent and difficult phonetics of American people, but with the help of my Utah teachers and mentors, i gradually developed the pitch to understand as well as to speak with them in their own language. "I enjoyed and learned a lot during the exchange visit at USA. I was engaged in various activities, like field trips, culture events, meet with kind peoples, hiking on mountains, ice skating which made my trip an unforgettable memory".

Anila Memon  
PhD Scholar IWRM-2015



"I'm from Gilgit-Baltistan, the northern part of Pakistan. After completion of my graduation in Islamabad, I was selected in USPCAS-W for MS Environment Engineering. My research field is wastewater treatment and during my visit at UU, I got very much support from the Chemistry Department of UU, where I utilized the facilities of laboratories for my research goal."

Iram Sifat  
MS (Environmental Engineering)

"My exchange visit was an incredible experience, never to be forgotten. It shaped a part of my character and change my view about life. I had the best time of my life in the University of Utah, USA. Exchange opportunity is to do and see things you could never dreamed of."

Muhammad Touseef  
MS (IWRM)



I am from Hunza, Gilgit, currently doing MS in Water Resources Management at USPCAS-W. I had a great experience for one semester at the University of Utah. The exchange visit improved my technical writing, communication and professional skills. I got the opportunity to learn fundamental and advanced hydroinformatics concepts using multiple softwares during the course study. The most exciting moment was exploring new places and interacting people from different cultures in the United States.

Uzma Jabeen  
MS (IWRM)

## Faculty Exchange Experiences

Exchange visit at University of Utah USA, has paved the way to enhance my capacities in all three sectors of my job i.e. teaching; research and services. During the exchange visit, I explored the beauty of United States by visiting national parks in the states. Hiking on Antelope Islands and camping in San Rafael swell were my breathtaking and ecstatic experiences.

Mr. Waqas Ahmed  
Assistant Professor USPCAS-W





Group Pictures of Cohorts During Exchange Training Program



Capacity Building of Stakeholders

The center aims to broaden the perspectives and enhances the capability of water professionals in Pakistan. in this connection, the Center has designed and conducted following training workshops for various stakeholders in the water sector.



S.No	Title of Training
1	Diploma Course in Flood Forecasting and Flood Hazard Management for engineers of Sindh Irrigation Department
2	Training workshop on Data Analysis using SPSS for various stakeholders
3	Workshop on Ground Water Data Analysis and Modelling for various stakeholders
4	Training Workshop on Climate Change Projections for various stakeholders
5	Training workshop on Advance Training in Hydraulic Modeling Using HEC-RAS for the officials of Sindh Irrigation Department
6	Training Workshop on Geo-informatics for various stakeholders
7	Workshop on Improving Groundwater Management and Modeling
8	Training Workshop on GIS & Remote Sensing concludes for engineers of Sindh Irrigation Department
9	Training workshop on Spate Irrigation jointly organized with RDF for various stakeholders
10	Training workshop on Flood forecasting for various stakeholders

Training of Engineeres of Sindh Irrigation Department



The Diploma Course for Capacity Building of Officers/ Engineers of Sindh Irrigation Department is a collaborative project between USPCAS-W MUET and Sindh Irrigation Department, Government of Sindh. The participants were professional engineers in the Irrigation Department who completed the diploma course on

“Flood Forecasting and Flood Hazard Management”. Total of 12 participants completed the course which included seven training modules and 16 credit hours that was designed by the experts of USPCAS-W MUET and the University of Utah, USA.

Honorably Justice Retired Amir Hani Muslim, Chairman



of Supreme Court-mandated Commission on Water and Sanitation of Sindh was the chief guest at certificate distribution ceremony of the diploma course.

The efforts taken by the MUET Water Center serving as a nucleus and a laboratory to facilitate the adaoption of necessary measures in the translation of water Sustainable Development Goal-6 are highly appreciable.

Honorably Justice Retired Amir Hani Muslim,  
Chairman of Supreme Court-mandated Commission on Water and Sanitation of Sindh

Dr. Steve Burain of University of Utah, Dr. Bakhshal Lashari, Prof. Rasool Bux Mahar of USPCAS-W, Syed Mazhar Ali Shah, Member Sindh Indus River System Authority (IRSA), Dr. M. Aslam Chaudhry, Former Secretary Irrigation Khalid Hyder Memon, Project Coordinator Water Sector Improvement Project (WSIP) Dr. Fateh Mari, Chief Engineers, MUET Deans, University of Utah Faculty, USPCAS-W Faculty, Civil Society Activists and a large number of students attended the diploma completion ceremony.



Students Internship Program

The center provides internship opportunities to students and for that purpose they are placed at different public, private and non-government organizations. So far, The student internship program is aimed at furnishing students of the center have been provided internship the students’ professional skills in work environment opportunity at following organizations.

No.	Name of Organization	Type
1	Pakistan Council of Research in Water Resources (PCRWR)	Government
2	National Agricultural Research Centre (NARC)	Government
3	Pakistan Meteorological Department (PMD)	Government
4	Space and Upper Atmosphere Research Commission (SUPARCO)	Government
5	Water and Power Development Authority (WAPDA)	Government
6	Pakistan Council of Scientific and Industrial Research (PCSIR)	Government
7	National Centre of Excellence in Analytical Chemistry (NCEAC)	Government
8	Sindh Irrigation Department (SID)	Government
9	Sindh Irrigation and Drainage Authority (SIDA)	Government
10	Water and Sanitation Agency (WASA) Hyderabad	Government
11	National Rural Support Program (NRSP)	Non-Government
12	World Wide Fund for Nature (WWF)	Non-Government
13	International Union for Conservation of Nature (IUCN)	Non-Government
14	Research and Development Foundation (RDF)	Non-Government
15	Isra Hospital	Private
16	Matiari Sugar Mill	Private
17	Rafhan Maize Products	Private

NETWORKING AND PARTNERSHIPS



The Center’s sustainability depends on the establishment of enduring partnerships with top ranking universities within and outside Pakistan to exchange ideas, collaborate on research and continue to raise the standards of higher education in Pakistan. The ability of the Center to raise revenues and make alliances with stakeholders is another essential aspect of the project’s sustainability wherein Center’s graduates demonstrate their value to the businesses and institutions for which they work, and the Center’s research solves problems of government, community and industry.

The Center firmly believes in building partnerships and linkages with the academic institutions, government and the business community to seek applied research solutions that strengthen the effectiveness of policy-making and drive Innovation, Competitiveness and Economic Growth. In the last four years the Center has been able to build following partnerships;

Name of the client/ Partner organization	Partnership Type	Area of collaboration
National (Pakistani)		
Government		
Pakistan Council Of Research In Water Resources (PCRWR)	Collaborative MoU and Project Agreements	Water quality, environmental Degradation
Sindh Irrigation Department, Government Of Sindh	Projects agreement	Capacity building of engineers and irrigation management
Water Sector Improvement Program	Project Agreement	Participatory irrigation management
Global Change Impact Study Center (GCISC)	Project agreement	Climate change



Name of the client/ Partner organization	Partnership Type	Area of collaboration
Agency for Barani Area Development (ABAD), Government Punjab	Project agreement	Barani Area Development Action Plan
Water and Power Development Authority (WAPDA) , Pakistan	Collaborative MoU	Research Agenda Development
Sindh Irrigation and Drainage Authority	Collaborative MoU and project Agreement	Participatory irrigation management
Pakistan Council of Scientific and Industrial Research	Research collaboration	Water quality
Sindh Agriculture University, Tandojam	Collaborative MoU	Collaboration on use of lab facilities
Non-Government		
National Rural Support Program (NRSP)	Project Agreement	Situation Analysis and impact Assessment Studies in WaSH
Oxfam Pakistan	Collaborative MoU and Project Agreement	Assessment of Participatory irrigation management
World Wide Funds for Nature (WWF) Pakistan	Collaborative MoU	Wastewater management and other joint activities
Sustainable Development Policy Institute	Collaborative MoU	Media communication and outreach
Indus Earth Trust	Collaborative MoU	Drinking water management
Private Industry		
M.A. Mohammadi & Co. – A Fish Processing Industry	Project agreement	Wastewater Management
Abrahim Textile Industry	Project agreement	
United Energy Pakistan Limited	Project agreement	
MATOL (Pvt.) Limited	Project Agreement	Waste Water Management
International Collaboration		
University of Utah	Technical Support	Technical assistant and joint research projects
Colorado State University	Technical Support	Technical assistant and joint research projects
Australian Center for International Agriculture Research (ACIAR)	Project Agreement	Participatory irrigation management
International Center for Agricultural Research in the Dry Areas (ICARDA)	Project Agreement	Efficient irrigation technologies
Heinrich Boll Foundation – A German Foundation	Project agreement	Water Quality
University of Nevada, Las Vegas	Technical Support	Technical assistant and joint research projects
University of Victoria, Canada	Technical support	Climate change
Emory University, USA	Technical support	School WaSH Services

# CONFERENCES AND SEMINARS

## International Science-Policy Conference on Climate Change

In December 2017, a three day international Science-Policy conference on “Climate Change” was organized by Global Change Impact Studies Center (GCISC) in Islamabad. CAS-W MUET, University of Utah, and partnered in the conference.

The honorabl Mr. Shahid Khaqan Abbasi the then Prime Minister of Pakistan was the chief guest and inaugural chair of the conference.

Pakistan is adopting the climate friendly-policy to tackle with Climate change. The policy has three objectives to fulfill; saving humanity lives, promoting sustainable development, and honoring the country’s international commitments.

**Esteemed Shahid Khaqan Abbasi,**  
Then Prime Minister Pakistan of Pakistan

The renowned economist and strategist Sartaj Aziz, Deputy Chairman Planning also honored the conference with his participation at closing ceremony.

Pakistan can strengthen the research capacity by introducing new projects in the area of Climate change.

**Sartaj Aziz**  
Deputy Chairman Planning



The prominent speakers alist in the inaugural and closing session had the names of Prof. Steve Burain- Director USPCAS-W University of Utah, Tom Downing - President and CEO global climate adaptation of the United Kingdom, Dr Youba Sokona- Special advisor on Sustainable Development at the South Center of UK, Dr Tariq Banuri the Executive director GCISC’s, Dr Adil Najam - former Vice-chancellor of LUMS and Prof. Mohammad Aslam Uqaili – Vice chancellor MUET.

The conference had 800 participants from varied fields e.g. science, law, education, media and activists. Conference focused on the relation between climate change & its effects on vitals of national interest. Overall it covered five themes; Climate Science, Climate & Water, Agriculture & Food Security, Migration, Policy & Finance, Impact & Adaptation. Other leading roles were played by USPCASW by organizing 9 technical sessions on Climate Change & Water Resources which were presented by 26 scholars. Also the center held round table meeting on Groundwater Management research.



## Executive Seminar on Water Governance



"Pakistan is facing acute problem of water availability and water security, including floods and droughts. Due to climate change we receive abnormal rains and consequently face heavy floods."

Honorable Syed Murad Ali Shah, "I would like to thank the government of Sindh for supporting the Centre for Advanced Studies in Water and for collaborating on aspects such as higher education and applied research in water-related disciplines, sharing of data and information, training on water sustainability issues, and organization of joint training events and workshops."

US Consul-General Brian Heath

The executive seminar on Water Governance was organized in August, 2015. The honorable Syed Murad Ali Shah the current Chief Minister of Sindh and then Sindh Minister for Finance and Energy chaired the session. US Consul-General Brian Heath and Dr. Randy Hatfield, USAID's Senior Policy Adviser and Program Manager (Sindh Basic Education Program) were also present on the occasion.

## Executive Seminar on Water SDGs



"Achieving Water Sustainable Development Goal-6 in Pakistan: Challenges and Opportunities" an executive seminar was held by the Center at Karachi in July 2016"

The inaugural session was chaired by honorable Syed Murad Ali Shah, the then Senior Minister for Finance, Energy, Planning & Development, and Government of Sindh. Whereas, Mr. Steve Urquhart, Global Ambassador University of Utah and Former Utah State Senator, Mr. Craig G. Buck, USAID Deputy Mission Director Sindh and Balochistan and Prof. Dr. Mohammad Aslam Uqaili, Vice Chancellor MUET spoke in the inaugural session. The technical session was chaired by Dr. Sikandar Ali Mendhro, Minister for Environment and Coastal Development Authority, Government of Sindh.

Dr. Tariq Banuri, Associate Director USPCAS-W, UU, Mr. Juan Carlos Negrette, Director Global Health, UU, Ms. Rehana Ali Memon, Secretary P&DD, Government of Sindh, Dr. Steve Burain, Director USPCAS-W, UU and Dr. Bakhshal Khan Lashari Project Director MUET were the key note speakers in the session. The seminar was attended by some 132 participants from different public and private organizations viz: GoS, USAID, UU, UNICEF, SIDA, WAPDA, Hisaar Foundation, FPCCI, LEAD (Pakistan), IUCN, MSDP/USAID, Nestle, Aquafina, Academia, Media and Researchers.

## 1<sup>st</sup> Graduation Ceremony

The graduating students with their newly acquired skills and knowledge will make essential contributions to enhance access to clean water, sanitation, and proper hygiene; protect water-related ecosystems; and help Pakistan adapt to the threats posed by climate change.

The Honorable Guest Grace Shelton, US Consul General while congratulating the graduating students



The Center organized its 1st Graduation Ceremony for awarding degrees to the 1st batch of MS students. The ceremony was held as the 4th session of 21st Convocation of MUET in the Auditorium Hall of USPCAS-W. Vice Chancellor MUET Prof. Dr. Mohammad Aslam Uqaili chaired the ceremony whereas Her Excellency Grace Shelton, US Consul General Karachi and Dr. Tariq Banuri, Professor from the University of Utah attended the ceremony as the guests of honor.

The degrees were conferred to 32 MS Scholars of the first batch. Besides that three students; Ms. Iram Sifat and Mr. Daniyal Aziz from Environment Engineering Department and Mr. Daniyal Hassan from Integrated Water Resources Management (IWRM), were presented memorable shields and the certificates of merit on their outstanding performance during their degree program. MUET Pro-Vice-Chancellor, Deans, the Registrar, the Controller of Examinations, senior professors, former vice-chancellors, water experts, civil society representatives, and students' parents attended the ceremony.



## National Consultative Workshop on Developing Water Research Agenda in Pakistan

It is important to have a significant research agenda which can give us meaningful national way forward in terms of preparing to conserve and efficient usage of available resources.

Respected Mr. Fazal Abbas Maken  
Federal Secretary for Ministry of  
Science and Technology

US Consul General while congratulating  
the graduating students



In collaboration with Pakistan Council of Research in Water Resources (PCRWR) and Higher Education Commission (HEC) of Pakistan the center organized a national consultative workshop on "Developing Water Research Agenda in Pakistan" in May, 2016 at HEC Islamabad. Main objective of the workshop was to develop the water sector research agenda. The agenda was intended to address the issues and challenges of Pakistan in water sector. Additionally, it aimed to realize

the goals spelled out in Pakistan Vision 2025, as well as the targets established under the water SDGs.

The expert consultation of workshop was made to develop research agenda in the water sector, realizing the goals spelled out in Pakistan Vision 2025, as well as the targets established under the water SDGs. The workshop was attended by water experts, researchers from public and private sector institutions, representatives of policy think tanks, NGOs and CSOs and media.

## SDPI's Eighteenth Sustainable Development Conference



The USPCASW, MUET was honored with allocation of a full session in 18th Sustainable Development Conference titled "Securing Peace & Prosperity" on Water, Sustainability, Equity, and Security organized by Sustainable Development Policy Institute (SDPI).

Mr. Khalid Mohtadullah,

Senior Advisor International Water Management Institute (IWMI) Islamabad and Senior Advisory Board Member at CAS-W UU gave special remarks on the topic.

The session was chaired by Senator Mr. Nisar A. Memon, Chairman, Water Environment Forum, Pakistan and Former Federal Information Minister and co-chaired by Dr. Tariq Banuri, Professor at University of Utah, USA and current Chairman HEC Pakistan.

The experts who presented their technical papers in the conference included Prof. M. Aslam Chaudhry from University of Utah (USA), Dr. Suleman Tahir from University of Gujrat (Pakistan) and Prof. Bakhshal Lashari from MUET.

## Young Researchers' National Conference on Water and Environment

Young researchers' National Conference on Water and Environment is paving the healthy competition among the young researchers through this conference. Apart from the academic activities USPCAS-W also focuses on applied research in the water sector and in this connection; the National Water Research Network (NWRN) has been established for joint consultation and undertaking collaborative activities under the umbrella of the Water Center.



The center has initiated a series of young researchers' conference namely National Conference on Water and Environment (NCWE)". The conference aims to encourage young researchers, students and scholars from all over the country to present, share and exchange their latest findings on water and environment-related issues. The initiative provides young researchers an

opportunity to present their research work through research papers and posters.

In both mega events of Young Researchers' (NCWE-17-18)" Noteworthy Vice Chancellor, MUET, Professor Dr. Mohammad Aslam Uqaili was invited chief guest at inaugural ceremony.



In the plenary session of 1st Young Researchers Conference, NCWE-17", Mr. Arif Hasan, the country's famous Urban Planner and Architect and Mr. Nadeem Ahmad, Manager Policy and Advocacy in Water Aid gave a talk on Issues related to Urbanization and Sustainable Development Goals (SDGs) and their expert areas. The technical sessions, chaired and co-chaired by the senior faculty of MUET and other universities. In total 52 research papers and 11 posters were presented by the young researchers from the country in the conference.

The 2nd Young Researchers' National Conference on Water and Environment (NCWE) was held at USP-CAS in August 2018. The eminent invited figures included Noteworthy Nisar A. Memon, the former Federal Minister & Senator, Director General Pakistan Council of Research in Water Resources (PCRWR) Dr. Mohammad Ashraf and Muhammad Abid, World Bank Water Resource Specialist. The conference consisted of two plenary sessions, 12 diverse technical sessions, besides opening and closing sessions.



## Sindh Development Dialogue 2018 Contextualizing the Past – Envisaging the Future



Sindh Development Dialogue 2018 on “Contextualizing the Past – Envisaging the Future” was held at Center. The event covered dialogues on structural reforms and establishment of Sindh and policy options.

The commanding speakers spoke on key areas of issue during program proceedings and sessions. The names of speakers and related topics were:

The dialogue was initiated on objectives presentation by Mr Zulfiqar Halepoto-CSC. The follow-up commanding Key Note speakers included high profiled names of Dr Ishrat Hussain, Economist Author & Former Governor State Bank of Pakistan; Dr Kaiser Bengali, Economist Author & Analyst; Mr Abrar Kazi, Water Expert & Author; Dr Rajab Memon, Renowned Analyst & Former Vice Chancellor; Advocate Mr. Shahab Usto; and Mr Suleman Abro, CEO SAFWCO who spoke on distinct issues on future development of Sindh during program proceedings and sessions.

Around 200 participants belonging to the water sector, industries, planning and development, academia and students participated in the dialogue.



## National Workshop on Environmental Degradation of Manchar Lake



The center organized a National Workshop on Assessment of Environmental Degradation of Manchar Lake with the cooperation of Pakistan Council of Research in Water Resources (PCRWR), Government of Pakistan. This workshop was aimed to share the finding of the initiated study and sensitize the stakeholders for the rehabilitation and restoration of the lake.

The honoring chief guest was Mir Hazar Khan Bijarani, then Senior Minister for Planning and Development, Government of Sindh chaired the workshop proceedings. Throughout proceeding Engr. Zamir Ahmed Soomro, Regional Director PCRWR also the Principal Investigator (PI) of the research study project and Ms. Uzma Imran, Faculty Member USPCAS-W and Co-PI of the project shared the technical and social aspects of their study.

## National Seminar on Indus Delta

The center organized a national seminar on Indus delta in order to share the results of the research study, funded by the Center. 'Shrinking Indus Delta: Current Status and Way Forward'. A detailed technical presentation was given by Prof. Dr. Altaf Ali Siyal, Principal Investigator of this study in which he shared the findings and results of his research and sought comments and suggestions from the participants. The seminar was largely attended by representatives of Government organizations, academia, civil society, coastal communities and faculty and students of the Center.





Center has also Organized Following Events in Collaboration with Different Partner Organizations

- ❑ MUET & USPCAS-W in collaboration with Coventry University, United Kingdom organized a three day “4th International Conference on Energy, Environment and Sustainable Development (EESD)” in November 2016.
- ❑ USPCAS-W in collaboration with National Rural Support Program (NRSP) and Pakistan Council of Research in Water Resources (PCRWR) celebrated World Water Day along with communities in March 2017.
- ❑ The Center celebrated Earth Day in April 2017 by planting trees in the new building of center followed by a badminton tournament organized at MUET Gymnasium. Faculty, Students, and Staff of the Center planted trees and participated in the tournament.
- ❑ The center in collaboration with Institute of Environment Engineering and Management (IEEM) MUET celebrated World Environment Day in June 2017. That year the theme was, “Connecting People to Nature.”
- ❑ The center in collaboration with WWF Pakistan marked the celebration of World Water Week (Stockholm) by paying a joint visit to Keenjhar Lake in September 2017. The trip was hosted by WWF-Pakistan at their Keenjhar Conservation and Information Center.
- ❑ A three-day workshop on Ground Water Data Analysis and Modelling was held in November 2017. The workshop was part of a four year project on Improving Ground Water Management to Enhance Agriculture and Farming Livelihood in Pakistan signed by the Australian Government through ACIAR.
- ❑ Sindh Irrigation and Drainage Authority (SIDA) in collaboration with the Water Center organized 2nd consultative meeting of water experts on Formulation of Sindh Water Policy (SWP) in December 2017.
- ❑ Strengthening Participatory Organization (SPO) Hyderabad in collaboration with the Water Center organized a seminar on “Importance of Women and Marginalized Groups in Water Governance and Peace Building Process” in December 2017.
- ❑ The Water Center and the Institute of Environment Engineering and Management (IEEM) MUET jointly organized the World Water Day in March 2019.
- ❑ A 5-day training “Introduction to Geographic Information System (GIS) and remote sensing using ArcGIS 10.3” was organized by the center in March 2018. Participants from academic and development sector organizations, faculty and students of the center attended the training.
- ❑ A consultative meeting on National Water Policy was held in May 2019 at the U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W), MUET Jamshoro. The meeting was attended by several national experts and visiting delegation of the University of Utah.

Graduate Seminar Series

Graduate Seminar series is one of key features of Center in which renowned water experts and practitioners are invited to deliver talks to the students and faculty of the Center on various subjects related to the water sector. So for, the Center has organized following graduate seminars.

S.No.	Seminar Title	Guest Speaker
45	Awareness Session on XDR(Extensively Drug-Resistant) Typhoid and its Re-medial Measures in Hyderabad	Dr. Bikha Ram (Vice Chancellor, LUMHS, Jamshoro)
44	Consultative Workshop on Pro-vision of Drinking Water in Ur-ban Sindh	Ms. Maha Ahmed, Assistant Pro-fessor NUST & Mr. Naveed Iftikhar, Public Policy Adviser
43	Research Commercialization and Entrepreneurship	Mr. Tahir Mehmood Chaudhry, President and CEO Pakistan Insti-tute of Entrepreneurship.
42	Intellectual Property Rights for Entrepreneurs (Trademarks, Copy Rights and Patents)	Advocates of High Court, Partner at Ali & Associates in collaboration with SMEDA
41	Evolution of Water Institutions in the Indus River Basin: Re-flections from the Law of the Colorado River	Dr. Irum Sattar, Visiting Fellow, Harvard Law School
40	Entrepreneurship and Devel-opment of Business Plan	Mr. Azhar Zaheer, University of Utah, USA.
39	Pakistan's Water Challenges: Need for Integrated Water Re-sources Management	Dr. Hassan Abbas, Freelance Water Expert, Pakistan
38	Technology Innovation and En-trepreneurship: Ecosystem for Universities of Pakistan	Dr. Zeeshan Khatri, Professor, MUET
37	An Efficient Ant-Fouling Strate-gy to Enhance the Applicability of Pressure-Driven Membranes in (Waste) Water Treatment	Dr. Ghulam Mustafa, Assistant Professor at the International Centre for Chemical and Biological Sciences (ICCBS), University of Karachi.
36	1. Water Security in Pakistan, 2. Water led SDG platform as a paradigm for economic development with climate and CPEC challenges	Sardar M. Tariq, Chief Executive Officer and Dr. Pervaiz Amir, Director Pakistan Water Partnership (PWP)
35	Smart Water Grids: Managing Complexity via Ubiquitous Sensing & Modeling Abstrac-tions	Dr. Abubakr Muhammad, Director, Center for Water Informatics & Technology (WIT), LUMS.
34	Grassroots Entrepreneurship & Women Empowerment in Water Sector	Ms. Najma Siddiqi, Renowned Development Expert of Pakistan
33	Operation and Maintenance Challenges for Irrigation Infra-structure held at MUET Water Center	Engr. Ghulam Mustafa Ujjan, Environment & Social Development Specialist in Sindh Irrigated Agriculture Productivity Enhancement Project
32	Climate Change and Its Impact on Water Resources in Pakistan	Dr. Badar Munir Khan Ghauri, Head Department of National Centre for Remote Sensing & Geo Informatics, Institute of Space Technology, Karachi

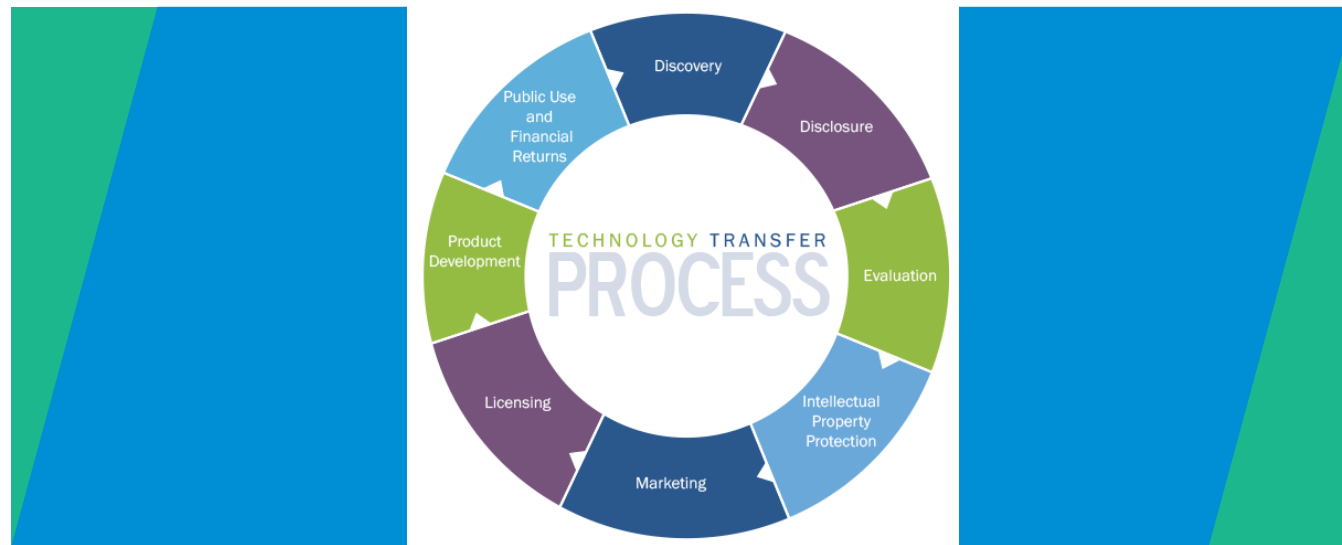


S.No.	Seminar Title	Guest Speaker
31	Climate Change Adoption in local farmers in Sindh	Mr. Hadi Bux Laghari, Consultant in Progressive Farming
30	Harnessing Water Resources and Environmental Issues in Nigeria	Prof. Dr. Mumtaz Sogah, Center for Sustainable Built Environment, Nigeria
29	Created and Destroyed Opportunities after Disasters	Mr. Arif Hassan, Urban Planner and Architect, Pakistan.
28	Community-Government Partnership for Metered Drinking Water: A Case Study of Bhalwal, Sargodha District of Pakistan	M. Naveed Iftikhar, Public Policy Adviser (PhD Scholar) and Mr. Nazir Ahmed Watto, Director of Anjuman Samaji Behbood (an NGO)
27	Redefining water resource management for sustainable and equitable use in Pakistan	Mr. Ghulam Mustafa Talpur, Regional Head, Oxfam International
26	Institutional Reforms in Irrigation and Sustainable Water Resources Management in Sindh	Nazeer A. Essani, GM Transition SIDA
25	Entrepreneurship is the mind-set, idea generation and innovation: Dr. Zeeshan Khatri	Dr. Zeeshan Khatri, Professor MUET
24	Investigation and Mitigation of Ground Water Quality Issues in Thar Desert of Sindh Province, Pakistan	Dr. Tahir Rafique, Senior Scientific Officer, PCSIR
23	Writing an Effective Research Proposal	Dr. Awais Khatri, Professor MUET
22	Indus basin modeling to generate confidence & cooperative decision-making across jurisdictional borders for the effective & equitable management of shared water resources.	Mr. Mobin-ud-Din Ahmad and Mr. Joel Stewart, Mr. Mobin-ud-Din Ahmad and Mr. Joel Stewart
21	Sustainable Consumption and Production: SDG 12	Mushtaq Ahmed Memon, Water Management Expert, United Nations Environment Programme, Korea
20	Sustainable WASH Project to the 2010/11 Flood affected Regions in Sindh	Dr. Heinz-Werner Kreutzer, A German Research & Scholar
19	Laboratory safety and security	Mr. Khalid Latif, Founder & Technical Director of KL – Technical & HSE Services, Pakistan
18	Impact of Climate Change on Meeting Water and Food Security SDGs	Dr. Mubarak Ali, Member Food Security Planning Commission Pakistan
17	Pakistan's Water Apportionment Accord 1991	Dr. Arif A. Anwar, International Water Management Institute, Pakistan
16	Water Management Planning in Pakistan Social	Dr. Khalid Riaz, COMSATS Institute of Information Technology, Islamabad
15	Providing Safe Drinking Water to Consumers: Options and Challenges	Prof. Christine Pomeroy, and Prof. Jim VanDerslice, University of Utah
14	How to Transform Ideas into a Viable Business	Mr. Waseem Vohra (FPCCI), and Dr Zeeshan Khatri, MUET

S.No.	Seminar Title	Guest Speaker
13	GLOF mapping and risk assessment in Hunza river basin using geospatial techniques	Dr. Arjumand Zaidi, USPCAS-W, MUET
12	Achieving Water SDG in Pakistan: Challenges and Opportunities	
11	Urban Climate Research: Applications of Remote Sensing and GIS	Dr. Haroon Stephen, Assistant Professor of NLV, USA
10	Hydrology and water resources engineering	Dr. Habib ur Rehman, Professor UET Lahore
9	Linkage between Engineering Research and Entrepreneurship	Dr. Shahid Qureshi, IBA Karachi
8	Sustainable Development and WEF Nexus	Dr. Tariq Banuri, Professor University of Utah
7	Empowering the Irrigation Re-forming Institutions in Sindh	Mr. Nazir A. Essani, GM Transition, SIDA
6	How to review research paper & write a research proposal	Dr. Sajjad Ahmad, Professor, Nevada University, USA
5	Water: Resources, Issues and Management	Dr. Iqbal Ahmed Panhwar, Professor Sindh University
4	Water Quality Around Us; Over-view situation in Hyderabad and Tharparkar	Dr. M. Iqbal Bhangar, Professor International Center for Chemical and Biological Sciences, Karachi
3	Impact of Climate Change on Water Resources of Sindh	Mr. Nisar A. Memon (Chairman Water and Environment Forum), Dr. Ghulam Rasool (DG PMD)
2	Health, Safety and Environment	Engr. Nizamuddin Domki, Senior HSE Engineer in Sui Southern Gas Company Ltd
1	Spate Irrigation: Potential and Challenges in Sindh	Mr. Karim Nawaz Baloch, Water Expert from Balochistan.



# TECHNOLOGY COMMERCIALIZATION AND ENTREPRENEURSHIP



In a competitive global environment, it is now impossible for universities to succeed or prosper without changing their orientation towards entrepreneurship and innovation. However, developing countries continue to struggle in this regard because of the absence of the necessary institutional arrangements and faculty incentives. Aligned with the objectives of U.S.-Pakistan Center for Advanced Studies in Water (USPCAS-W), the center in collaboration with University of Utah USA is striving to create an environment where the research is linked with the market needs and focused towards resolving the water related problems of the country. In order to promote concept of technology commercialization and entrepreneurship, the center has taken following initiatives.

1. Introduced a course of Entrepreneurship.
2. Established a standing committee on Water under FPCCI. This is meant to bridge the gap between academia and industry.
3. Initiated client-driven projects with textile, fishing and sugar industries as CBM to enhance productive linkages with the industry.
4. Developed linkages with KATI and Pakistan Business Council to initiate applied research projects on pilot basis.
5. Organized seminars and workshops to create linkages between academia and the industry for technology commercialization.
6. Organized International Seminar on "Entrepreneurship, Technology, and Institutional Sustainability in Higher Academia". Organizing trainings and workshops to sensitize faculty and students in entrepreneurship.
7. Linkages between engineering research and entrepreneurship.
8. How to transform ideas into viable business.
9. Entrepreneurship is the mindset, idea generation, and innovation.
10. Grassroots entrepreneurship and women empowerment.
11. Technology innovation and entrepreneurship: ecosystem for universities of Pakistan.
12. Entrepreneurship and developing business plan.
13. Intellectual property rights for entrepreneurs.
14. Research commercialization and entrepreneurship.
15. Introduced an exclusive exchange training program on entrepreneurship at University of Utah.
16. Establishing a living lab of Water Quality aimed for two purposes i) install a comprehensive water treatment plant to be used for research and ii) setting-up a Bottled Water Company to produce high quality drinking water and commercialize.

## Workshop on Entrepreneurship, Technology, and Institutional Sustainability in Higher Academia



Beholding modern age challenges, USPCAS-W organized a collaborative workshop on "Entrepreneurship, Technology, and Institutional Sustainability in Higher Academia" in Karachi in July 2016. The workshop was organized in collaboration with Office of the Research Innovation and Commercialization (ORIC) and Institute of Science, Technology & Development (MUISTD) of MUET and Pakistan Science Foundation (PSF). On this event, a number of valued figures spoke on the Supporting Entrepreneurship and Challenges of Entrepreneurship. The names of corresponding speakers included:

Dr. Ishrat Husain, Director, IBA Karachi; Mr. Nisar Memon, Senator/Formal Minister of Information; Mr. Shahid Rashid, Chairman, IPO ; Dr. M. Akram Sheikh, Member (Science), PSF; Dr. Tariq Hassan, former Chairman, SEC-Pakistan ; Dr. M. Shahid Qureshi, IBA, Dr. Rashid Aftab, RIU and Mr. James Thompson, Executive Director TVC Utah University. Dr. Mukhtar Ahmed, the then Chairman HEC also participated in the conference through video link.

Experts belonging to higher academia, industry, research and development organizations, corporate sector, civil society and government officials attended the workshop.

### Workshop Recommendations

- Success and sustainability of higher educational institutions in Pakistan is unified with Entrepreneurship, Technology Transfer and Venture Commercialization.
- Compilation of TVC related initiatives of HEC
- Compilation of TVC related success stories of IBA Karachi
- University Innovation Policy by making IP its part
- Establish a one stop shop within FPCCI or some other institution for those who want to pursue their innovations for commercialization
- Promote IP policy, encourage disclosure and execute process of evaluating disclosures
- Create productive link with Industry
- Share/Replicate the models available with other Universities.
- Courses on entrepreneurship in Higher Education
- FPCCI to provide a forum for funding opportunity

### List of client-driven projects

- Eco-innovation in textile processing industry of KITE for sustainable product processing
- Wastewater Treatment and Reuse to approach zero water discharge in Al-Rahim Textile industries i.e. substantial increase in water use efficiency in Textile processing
- Treatment and reuse of wastewater of fish processing industry
- Rehabilitation of sewage treatment plant (STP) installed at Niamat gas Field, United Energy Pakistan limited
- Situation Analysis of Waste Management at processing facilities of United Energy Pakistan (UEP)



# GENDER EQUITY



The Mehran University of Engineering and Technology (MUET) is the first public sector university with a gender equity policy. MUET has adopted a policy to make gender-friendly campus in terms of inclusiveness, empowerment and equity being the important pillars of its gender policy. The policy was formulated through a consultative process to elaborate on MUET gender policy to seek inputs and ideas from the faculty, students, administrative staff, civil society organizations and other stakeholders.

The Article 34 of the Constitution of Islamic Republic of Pakistan requires that “steps shall be taken to ensure full participation of women in all the spheres of national life”. The Constitution also promises equality of rights for all, regardless of gender. The issues regarding women rights and empowerment as well as gender equity and equality are gaining increasing importance at all levels. To meet commitments at all levels Pakistan’s 2025 Vision focuses on ending the discrimination faced by women. The vision enables friendly environment for them to realize their full potential and make their contribution in the socio-economic growth of the country.

### Objectives

- Promote diversity and inclusiveness amongst its faculty, students and staff
- Support women and girls in the realization of their full human rights
- Reduce gender inequalities in access to research and education related resources and benefits.

## Gender Policy Framework

1. Establishing institutional and policy framework for making MUET a gender-friendly campus, where gender equity is understood to be a top management priority.
2. Adopting and promoting HEC policy guidelines against sexual harassment in institutions of higher learning.
3. Providing an inclusive environment in which everyone irrespective of its gender and socio-ethnic, economical and religious backgrounds can participate and benefit.
4. Strengthening legislative framework to protect women’s rights, enhance their empowerment, and eliminate discriminatory practices in all their forms.
5. Moving towards improved gender-parity in students’ population, in faculty and non-faculty positions, in decision making bodies, and in access to scholarly benefits.
6. Creating, mentoring and leadership opportunities for empowering women students, staff, and faculty, and strengthening their participation in academic and extra-curricular activities.
7. Promoting partnerships with institutions and networks which encourages advancing gender equity and women empowerment agenda.
8. Identifying good practices in eliminating gender-based stereotypes and public perceptions which prevent women from reaching their full potential in public life.
9. Learning from good practices on gender equality and anti-discrimination laws and policy instruments being implemented elsewhere.
10. Ensuring that on-campus facilities and infrastructure (both teaching and research) is consistent with the needs of both women and men.

The Gender Equity Plan (GEP) provides policy guidance, specific actions to promote equity, and addresses to both employees and students. The plan also contributes for a better gender balance in categories of staffing and study programs, and promotes an organizational culture for working and learning that will give woman and men equal opportunities.



## USAID Policy on Gender

“Gender issues are central to the achievement of strategic plans and Assistance Objectives (AO) and USAID strives to promote gender equality, in which both men and women have equal opportunity to benefit from and contribute to economic, social, cultural, and political development; enjoy socially valued resources and rewards; and realize their human rights”.



## WOMEN RESOURCE CENTER (WRC)



The Women Resource Center (WRC) is an association that aligns the effective implementation of MUET's gender policy and helps in transforming policy principles into active realization. The center is a platform to create a spark of leadership in female staff and students. It promotes the policy through facilitating programs, counseling services and training & learning opportunities. Additionally, the infrastructure including the interior and material is planned carefully for better impact and services. This Step is affirmative to promote the gender sensitive and women friendly culture across the campus.

In pursuance of sensitizing the stakeholders on gender equity, MUET has organized following events.

- A talk by Ms. Khawar Mumtaz, Chairperson National Commission on Status of Women (NCSW) on formulation of national gender equity policy for higher education institutes
- Establishment of Society of Women Engineers (Sindh Chapter)
- Annual celebration of International Women's Days
- Networking events with female students of the Centre
- Organized sports events on annual basis.
- Fulbright Scholarship Information Session
- Jashn-e-Baharan celebrations at women hostel
- Sindh Young Girls Festival
- Event Significance of Women educational and professional development
- Policy Dialogue on water of Women



## DIGNITARIES' VISITS TO CENTER

Ms. Grace W. Shelton, US Consul General Karachi visited USPCAS-W, MUET in January 2017 and met with students and the faculty of the Center, who recently returned after spending one semester at University of Utah (UU) in the USA under exchange training program. Dr. Randy Hatfield, USAID Senior Policy Advisor, Mr. Hafeezullah Samo, Agreement Officer's Representative USPCAS-W and other officials of US Consulate and USAID participated in the event.



Mr. John Groarke, the Deputy Mission Director USAID meeting with faculty of Center during his first visit to the Center in March 2017.

Mr. Ahsan Iqbal, Federal Minister for Planning, Development, and Reform, Government of Pakistan visited USPCAS-W in April 2017.

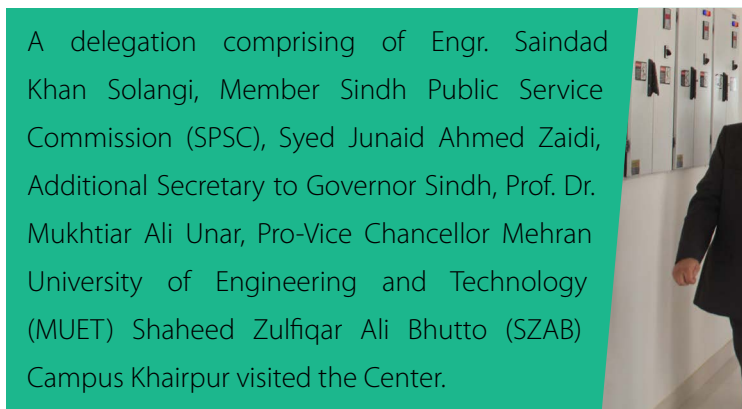


Prof. Dr. Arshad Ali, then Executive Director Higher Education Commission (HEC) Pakistan, visited the Water Center in October, 2017.





Chairman of Charter Inspection and Evaluation Committee (CIEC), Government of Sindh and Former MUET Vice Chancellor Prof. Dr. Abdul Qadeer Khan Rajput visited the Center in November 2017.



A delegation comprising of Engr. Saindad Khan Solangi, Member Sindh Public Service Commission (SPSC), Syed Junaid Ahmed Zaidi, Additional Secretary to Governor Sindh, Prof. Dr. Mukhtiar Ali Unar, Pro-Vice Chancellor Mehran University of Engineering and Technology (MUET) Shaheed Zulfiqar Ali Bhutto (SZAB) Campus Khairpur visited the Center.



A World Bank delegation comprised of Ms. Tazeen Fasih, Lead Economist, and Ms. Ghazala Syed, Education Training Specialist visited Center in June 2019.



Prof. Dr. Craig Phelan, Dean, School of Arts, Humanities, and Social Sciences, Habib University Karachi visited center in May 2019.



USAID Deputy Mission Director for Sindh & Balochistan Mr. John Smith-Sreen and USAID Deputy Office Director Michael Hryshchshyn visited the center in September 2018.



## MEDIA COMMUNICATION AND OUTREACH



Development and implementation of the effective communication and outreach strategies have always been critical in achieving the desired program outcomes.

Taking into consideration the significant and importance of augmented and effective program outreach, different activities have been done so far including media coverage, awareness raising seminars with local stakeholders, writing of news features, launching of website, printing and publication materials. Nevertheless, the impact of objective outreach to

different Pakistani Universities and conduct interactive sessions with the students and faculty regarding project orientation was considered in top priority.

In order to provide first-hand information on the degree programs and benefits offered by the Center to the concerned students of other universities, encourage dwomen students to participate in centers activities, and to disseminate the research results ad outcomes among stakeholders, the Center initiated an outreach program and conducted following activities across Pakistan.



## USPCAS-W Outreach Activities

The Center has conducted orientation sessions at following universities of Pakistan:

- University of Engineering and Technology – Taxila Punjab
- University of Engineering and Technology - Lahore, Punjab
- University of Agriculture - Faisalabad, Punjab
- University of Agriculture – Peshawar, Khyber Pakhtunkhwa (KPK)
- University of Engineering and Technology – Peshawar, Khyber Pakhtunkhwa (KPK)
- Quaid-e-Awam University of Engineering, Science and Technology (QUEST) Nawabshah, Sindh
- NED University of Engineering and Technology, Karachi



- Sardar Bahadur Khan Women University, Quetta
- Balochistan University of Information Technology, Quetta
- Baluchistan University of Engineering & Technology, Khuzdar

The Center has participated in following outreach events

- Sindh TV News programs
- FM-101 Radio show
- FM LUMHS Radio program
- Annual Dawn Education Fair 2016, 2017 and 2018 at Hyderabad and Sukkur in the months of March every year.
- Karachi International Water Conference by Hisar Foundation in Nov 2017.
- First Sindh Water Expo at Mirpurkhas in March 2018.
- NUST Research Expo in April 2018





## USPCAS-W Promotional Material



## Vision

To establish a world class education and research center dedicated to solving water related problems of Pakistan and to develop strong and productive liaison with local and international organizations aiming to support Pakistan's economic development.

## Mission

To train present and future faculty, young scientists, engineers, managers and other stakeholders with state of the art techniques and cutting edge knowledge in the water sector. Through collaboration with academia, government and industry we will pursue applied research solutions to water sector problems and bring about policy reforms aiming to strengthen economy of Pakistan.

## Contact:

**U.S.-Pakistan Centers for Advanced Studies in Water**  
Mehran University of Engineering and Technology, Jamshoro-76062, Sindh - Pakistan

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