



U.S.-Pakistan Center for Advanced Studies in Water
Mehran University of Engineering & Technology
Jamshoro, Sindh, Pakistan

2022 Volume II

Newsletter

Eco-Innovation for Sustainable Industrial Growth

Principal Investigator: Prof. Dr. Zubair Ahmed



Food Sector



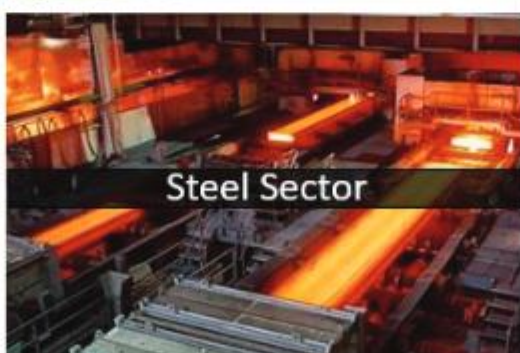
Chemical/Pharma Sector



Textile Sector



Automobile & Allied Sector



Steel Sector



Marble Sector

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- Focused Group Meetings

PREFACE

US-Pakistan Center for Advanced Studies in Water (USPCASW) has initiated a research project on Eco-innovations in the industrial facilities of SITE. The project is funded by Higher Education Commission (HEC) Pakistan. Prof. Dr. Zubair Ahmed, Mehran University of Engineering and Technology, Jamshoro, is the principal investigator (PI) of the proposed research. Prof. Dr. Jinhui Li, Tsinghua University, China, is an academic partner from China.

The proposed research will investigate eco-innovations within the major industrial sectors by analyzing production technologies associated wastewater reducing/elimination measures and innovative wastewater treatment technologies. The proposed research aims to develop a policy framework for adopting the eco-innovation approach. The objectives of the research are:

- (1) To examine existing environmental measures in major industrial sectors.
- (2) To develop new eco-innovation options.
- (3) To develop a plan for the management of underlying factors creating challenges in the adoption of eco-innovation strategies.

In a broader aspect, the proposed research will widen the door of industrial-academia collaborations in terms of technological development for sustainable growth. It will promote an eco-innovation strategy within existing industries. Policy framework protocols will be prepared for Eco-goals (eco-innovation goals) to be implemented in different industrial sectors.

Specifically, the study will identify the gaps within the industries and develop new environmental options, including technology advancement, process modifications, and waste reduction techniques, which are environmentally sustainable and economically feasible.

CONSULTATION WITH INDUSTRIAL ASSOCIATIONS & EXPERTS

Meeting with Executive Committee Members of KATI Association

On 3rd October 2022, the project team met with executive committee members of the KATI Association at Korangi Association of Trade & Industry (KATI) to identify key stakeholders and form the National Steering Committee. Dr. Zubair Ahmed described project objectives and different segments of the project and provided the valuable insights into the successful pursuance of the project objectives to the executive members of KATI Association. The KATI Association shook hands with project team and assured their collaboration throughout the project duration and requested project team for letter of interest.



Meeting with Food Industry Expert



On 3rd October 2022, a meeting was held with Mr. Tariq Ali (Head of Planning & Supply Chain PCL Karachi) at Pearl Confectionery Limited (PCL), Karachi, to disseminate project information and enhance academia-industry collaboration by initiating project activities at PCL, Karachi. Dr. Zubair Ahmed briefed Mr. Tariq Ali about the project's scope, objectives, and outcomes and inquired about the cooperation of PCL, Karachi, in the project. Mr. Tariq Ali appreciated the project team's efforts and agreed to collaborate with the project team. He also assured the project team of continuous support of PCL throughout the project.

Meeting with Executive Committee Members of SITE Association



On October 3, 2022, the project team met with the executive members of the SITE Association, Karachi. The objective of the meeting was to identify key stakeholders of the project and form the National Steering Committee (NSC). Dr. Zubair Ahmed described the project objectives and different segments of the project and provided valuable insights into the successful pursuance of the project to the executive members of SITE Association. The SITE association shook hands with the project team and assured their

collaboration throughout the project duration and agreed to nominate two members from SITE for National Steering Committee.

Meeting with Chemical Industry Expert

On 2nd December 2022, a meeting was held with Mr. Abdul Salam (Head of Environment, Health & Safety & COO ARCHROMA Plant Jamshoro) at ARCHROMA, Jamshoro, to disseminate project information and enhance academia-industry collaboration. Dr. Zubair Ahmed briefed Mr. Abdul Salam about the project's scope, objectives, and outcomes and inquired



about the cooperation of ARCHROMA Pakistan in the project. Mr. Abdul Salam appreciated the project team's efforts and agreed to collaborate with the project team. He also assured the project team of sharing project objectives with his fellow industries for collaboration.

Meeting with Wire Industry Expert

On 09 December 2022, Meeting was held with Mr. Saud Mehmood (COO Pakistan Wire Industry). The purpose of the meeting was to enhance industry-academia collaboration.



Meeting with Pakistan Association of Automotive Parts & Accessories Manufacturer

On 09 December 2022, Pakistan Association of Automotive Parts & Accessories Manufacturer (PAAPAM) meeting was held with Mr. Aslam Shaikh (Zonal Secretary) & Mr. Asim Lodhi (Co-Ordinator, PAAPAM) at PAAPAM Office, Karachi.



National Steering Committee Meeting

On 16th November 2022, the 1st National Steering Committee Meeting was held at Beach Luxury Hotel, Karachi. The meeting was attended by Prof. Dr. Zubair Ahmed (Principal Investigator and Conveyor), Prof. Dr. Rasool Bux Mahar (Co-PI), Dr. Naveed Ahmed (Co-PI), Dr. Asmatullah (Policy Expert), Dr. Tanveer Ahmed (Technical Expert), Mr. Bahadur Ali (Research Assistant) Mr. Suresh Kumar (Research Assistant), Mr. Muslim S. Mohamedi (Vice President, KATI and Chair of the NSC), Mr. Ashique Ali Langha (Director Technical, SEPA), Mr. Hussain Moosani (Vice President, SITE Association), Mr. Kamran Arbi (Ex Vice President, SITE Association), Mr. Muhammad Javaid Cheema (Manager Technical Support, Descon Engineering Ltd.), Mr. Rashid Ahmed (Manager Capacity Building/pieces of training, WWF Pakistan) and Mr. Abdul Malik (Assistant Director Technical, SEPA).

The agenda of the meeting was to review the project's progress and discuss future work plans. The meeting was chaired and initiated by Muslim S. Mohamedi. In opening remarks, Prof. Dr. Rasool Bux Mahar (Director, USPCAS-W, Mehran UET Jamshoro and Project Co-principal Investigator) warmly welcomed the participants and requested Prof. Dr. Zubair Ahmed to share the project progress. Prof. Dr. Zubair Ahmed, Principal Investigator, gave a detailed presentation on the project's progress and future work plan. After that, the progress of the project and hindrances were discussed. The aim of the national steering committee was successfully achieved by sitting together and discussing project-related issues to get solutions. Dr. Zubair Ahmed appreciated the participation of each member in the meeting. He gave cordial thanks to participants for their valuable suggestions on hindrances faced by the project team in achieving project objectives.



Capacity Building and Industrial Training Sessions

Training of Trainers

On October 7, 2022, in training of trainers, Dr. Zubair Ahmed, a principle investigator, discussed project activities and segments and future line of action with his team members. Dr. Zubair Ahmed (PI) distributed project activities among members and instructed them for timely completion of project goals.



Training Workshop on Energy Management



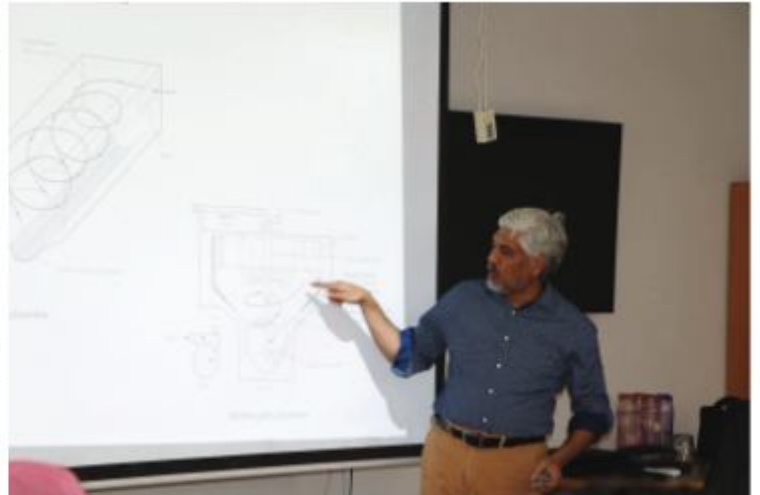
On 26 November 2022, a training workshop on Energy Management System (ISO - 50001) & Energy Auditing was organized by USPCAS-W, and Mr. Syed Ayaz Ahsan (Auditor and Consultant, NEC) chaired the training.

In the welcome remarks, Prof. Dr. Zubair Ahmed (Head of the Environmental Engineering Department, USPCAS-W, and Principal Investigator of the project) greeted the chairperson, Mr. Syed Ayaz Ahsan, and participants from various organizations, including Sindh Environmental Protection Agency (SEPA), K-Electric, MUET, and Textile Industries.

In training, Mr. Syed Ayaz Ahsan talked in-depth about the Environmental Management System, Requirements of ISO50001, and Core Energy Efficiency Options. Upon the successful completion of training, certificates were distributed among the participants.

Two Days Training on Industrial Water and Wastewater Treatment

On 01 – 02 November 2022, USPCAS-W, Mehran UET Jamshoro, organized two days training workshop on "Industrial Water and Wastewater Treatment." The instructor of training was Prof. Dr. Zubair Ahmed (Principal Investigator of the Project and Head of the Department of Environment Engineering) welcomed the professionals, researchers, and students from different industries and research institutions who participated in the training.



During training, Dr. Zubair Ahmed briefly covered the major concepts and processes of Industrial Water and Wastewater Treatment. Professionals from industries raised concerns involved in their water and wastewater treatment plants, and Dr. Zubair Ahmed recommended feasible options to tackle them. Also, participants were given tour of USPCAS-W laboratories.



In closing, Dr. Rasool Bux Mahar (Director, Professor, USPCAS-W and Dr. Kamran Ansari (Co-Director, Professor, USPCAS-W) appreciated the professionals for their presence and congratulated Dr. Zubair Ahmed and his team for the successful completion of training. After the successful completion of the training, certificates were distributed among the participants.



Focused Group Meetings

Focused Group Meeting with Marble Sector



On 21st September 2022, Focused Group Meeting with Marble Sector was held at GB Marble Industries, Manghopir Area Karachi. The stakeholders and representatives from the marble industries attended the meeting. The agenda of the meeting was to identify the environmental issues of the marble sector and possible eco-innovation measures.

The meeting started with a welcome note. The Project team briefly described the project theme to stakeholders of Marble industries. Dr. Zubair Ahmed (Principal Investigator)

discussed the project's different segments and provided valuable insights about the successful pursuance of the project. In the meeting, the marble sector stakeholders gave valuable feedback on project activities and discussed their existing industrial scenarios and related environmental issues with the project team.

Stakeholders mentioned abundant water and energy consumption as significant issues in the marble sector. Dr. Zubair Ahmed recommended using an RO system and a Solar system to deal with water and

energy issues, respectively. Stakeholders requested a team for the feasibility studies of suggested solutions.

Upon the end of the discussion, Dr. Zubair Ahmed informed stakeholders about his team's research on conditioning saline soil using Marble slurry. Stakeholders appreciated Dr. Zubair Ahmed and his team's efforts and asked the team to share results once obtained. Also, they requested a feasibility study on using Marble slurry as a raw material.

Focused Group Meeting with Food Sector

On October 17, 2022, a Focused Group Meeting with Food Sector stakeholders was held at S.I.T.E. Association, Karachi. The Executive committee members of the S.I.T.E association and individuals from food industries located in S.I.T.E Karachi attended the meeting. The agenda of the meeting was to identify the environmental issues of the food sector and possible eco-innovation measures.

Dr. Zubair Ahmed (Principal Investigator and Head of the Environmental Engineering Department, USPCAS-W, Mehran University of Engineering & Technology, Jamshoro.) briefed participants about the Project. He recommended relevant Eco-Innovations measures and

technological advancement. Further, Dr. Zubair Ahmed said that the project team would work with the food sector to improve their processing streams for the Conservation of Water, Energy, and waste and adopt 3Rs for sustainable industrial growth. In this way, the pollution load on the system will reduce. Also, the concept of chemical leasing to minimize chemical usage was suggested by Dr. Zubair Ahmed.

Members of SITE appreciated Dr. Zubair Ahmed's recommendations. Mr. Kamran Arbi, the Ex-Vice president SITE association, emphasized the benefits of chemical Leasing for industries. He said the need to maintain chemical stocks and

hazards caused by chemicals would diminish by chemical leasing. He also mentioned the potential challenges for the adoption of chemical leasing, particularly the requirement and shift of business model and suppliers' reluctance due to lack of technical capacity. The feasibility of chemical leasing may increase by strengthening the trust level among industry & chemical suppliers, Mr. Saeed ur Rehman added.

In the end, participants appreciated the project team's efforts in offering environmental services to industries for sustainable growth and protection of the environment.



Focused Group Meeting with Textile Sector



On 28th October 2022, Focused Group Meeting (FGM) was held with Textile Sector under Eco-innovation for sustainable industrial growth of major industrial sectors in Special Economic Zones (ECZs) under CPEC. The FGM was aimed at understanding what sorts of challenges Textile industries are facing in terms of Conserving Water, Energy and Chemicals. To achieve this objective, the representatives of different Textile industries from Karachi, Kotri and Nooriabad were gathered at US-Pakistan Center for Advanced Studies in Water, MUET, Jamshoro.



Project Team



Prof. Dr. Zubair Ahmed | Principal Investigator

Dr. Zubair Ahmed has more than 30 years of teaching, research, and consulting experience. Currently, he is working as a Professor and Head of the Department of Environmental Engineering and Sciences at the US – Pakistan Center for Advanced Studies in Water, Mehran UET Jamshoro. Dr. Ahmed also taught at Sejong University (Seoul, South Korea), Hallym University (Cheoachun, South Korea), Universiti Teknologi (Malaysia), King Abdul Aziz University (Jeddah, Saudi Arabia), Western University (Canada) and University of Utah (USA). He taught different environmental subjects, including Physical, Chemical, and Biological Processes, Waste Water Treatment and Design, Advanced water and Wastewater Treatment design, and Water Reuse. Dr. Zubair's research interest is in biological wastewater treatment, particularly in the application of membrane bioreactors for nutrient removal, biofouling, microbial community structure in sludges, anaerobic digestion of waste, and the fate of emerging pollutants in MBRs. He has been involved in several national and international environmental projects, including the implementation of cleaner production technologies in textile industries, techno-economic studies of wastewater treatment plants, environmental impact assessments and environmental audits of industrial units, pilot plant studies for domestic/industrial wastewater treatment using innovative processes such as sulfur-based autotrophic denitrification & up-flow anaerobic sludge blanket process. His primary research interest is in biological wastewater treatment, particularly in the application of membrane bioreactors for nutrient removal, biofouling, microbial community structure in sludges, anaerobic digestion of waste, and the fate of emerging pollutants in MBRs.



Prof. Dr. Rasool Bux Mahar | Co-Principal Investigator

Meritorious Professor/ Director, in the U.S.-Pakistan Center for Advanced Studies in Water at Mehran University of Engineering and Technology, Jamshoro, and also as Chief Editor of Mehran University Research Journal of Engineering & Technology. He did Ph.D. from Tsinghua University, Beijing, China, and a Post Doctorate from the University of Utah, USA. He has more than 25 years of teaching and research experience. Dr. Mahar published more than 100 research papers in International Repute Journals and presented more than 50 papers at National and International conferences and symposiums. Dr. Mahar has supervised 12 PhDs and more than 100 master's students. He has remained as a Co-director/ HoD of the Environmental Engineering Department, in the Institute of Environmental Engineering & Management; Mehran University. Worked as a Project Coordinator/P.I in various research projects funded by various donors, i.e. Pak (HEC) & US(S&T), HEC, DFID, TEARFUND, & UNEP, etc. He worked as Principle Investigator in Heinrich Böll Stiftung (German foundation). He worked on bio-energy especially converting organic waste into energy. He conducted various Environmental Impact Assessments (EIAs) for

rehabilitation of canals, minors, and distributaries, which includes Baseline survey, identification of environmental issues and their mitigation measures, formulation of Environmental Management Plan (EMP); Environmental Scoping and Screening Reports (ESSR) of various projects.



Dr. Asmatullah | Policy Expert

Dr. Asmat Ullah is currently working as Assistant Professor in the US. – Pakistan Centre for Advanced Studies in Water (USPCASW) at Mehran University of Engineering and Technology (MUET), Jamshoro, Pakistan. He is an environmental and resource economist with scientific and professional interests in crosscutting issues, including life cycle assessment, circular economy, sustainable consumption and production, farming and natural resource sustainability, contemporary discourse analysis, regional institutional analysis, contextual analysis, regional policy analysis, environment, and society, and participatory irrigation management. He has more than ten years of working experience in various national and international organizations. He was involved in different research projects related to sustainable consumption and production, circular economy, water resources management, agriculture, food security, and agricultural water productivity.



Dr. Naveed Ahmed | Co-Principal Investigator

Dr. Naveed Ahmed has a Ph.D. degree in Biological Environment from Kangwon National University, South Korea with around 3 years of postdoctoral research experience in South Korea. Most of his work is published in peer-reviewed articles in prestigious scientific journals. His research interests include biosensor development, toxicity assessment, sulfur-oxidizing bacteria, struvite recovery from swine wastewater, anaerobic digestion, and sulfur-utilized denitrification of groundwater.



Dr. Tanveer Ahmed Gadhi | Technical Expert

Dr. Tanveer Ahmed Gadhi has a doctorate in Chemical Engineering with distinction from Politecnico di Torino (POLITO), Italy, and currently working as an Assistant Professor in US. Pakistan Center for Advanced Studies in Water, Mehran University of Engineering and Technology, Jamshoro. His doctorate work was related to the design and development of photocatalytic nanomaterials and their application in wastewater treatment. He has remained as visiting scholar at the University of Utah, USA, the University of Ontario, Institute of Technology (UOIT), Oshawa, Canada, the UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO (UNAM), Mexico. He has five years of working experience in the leading textile industry in Pakistan, with added expertise on the conservation of industrial water, energy and chemicals, and environmental sustainability. He has published various research papers in reputed international and national journals and is the author of two book chapters in international books and led several industrial projects related to environmental management, wastewater treatment, recycling, and reuse. He is also collaborating with Surface Chemistry of Material Group-DISAT-POLITO, on the research and development of nanomaterials to treat emerging contaminants and water-borne pathogens.



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