

ORIC

NEWSLETTER



Capital University
of Science and Technology Islamabad



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Capital University of Science & Technology

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Patron

Prof. Dr. Muhammad Mansoor Ahmed

Chief Editor

Prof. Dr. Aamer Iqbal Bhatti

Editors

Muhammad Farhan

Muhammad Raheel Anjum

Graphic Designer and Photographer

Taaruf Ullah Khaweri

Dean ORIC Message



Capital University of Science & Technology (CUST) Islamabad is a progressive academic institution determined to produce competent professionals, who could be instrumental in the development of a prosperous society. The core objective of ORIC at CUST is to provide strategic and operational support to the university research activities, strengthen academia-industry linkages and promote entrepreneurship, technology transfer and commercialization activities. ORIC has responsibility of guaranteeing that all the research programs and policies reflect the

core values of academic freedom, professional integrity, ethical conduct and full compliance with all policies, legal requirements and operational standards of the university. We believe in continual skill development of our students to satisfactorily equip them with modern tools and technical skills set vital for the industry. A number of joint ventures are being done with industry through mutual collaborations. To showcase our recent progress report, the ORIC Newsletter Fall-2020 is in your hands. This Newsletter entails the contribution of ORIC towards its explicated domains i.e. Research Operations, Technology Incubation & Innovation and Industrial Liaison. It is comforting to see that ORIC is playing its leading role in facilitating university's research outcomes, Technology Transfer and Commercialization activities. The Office of Research, Innovation and Commercialization has done great work in compiling this Newsletter of great value and is committed to unfold its prolific endeavor to the next level.

Prof. Dr. Aamer Iqbal Bhatti

CUST ORIC Drive under the Guidelines of HEC

As technologies have grown more sophisticated and emerging industries have become more high-tech, universities have become more important players in the processes of invention, innovation, and commercialization. To make research a top priority for a sustainable future knowledge economy and link research and commercialization from the University with emerging and existing firms across Pakistan, Higher Education Commission (HEC) has initiated to establish Office of Research, Innovation and Commercialization (ORIC) across universities. HEC has assigned ORIC to facilitate university research operations, develop mechanisms for research commercialization and work diligently for innovation and entrepreneurship. In accordance with HEC recommendations regarding essential wings, ORIC at CUST performs under three major domains namely Research Operations, Technology Incubation and Innovation and Industrial Liaison.

HEC has made ORICs responsible for research fund raising and provision of information to faculty about various available research grants. ORIC at CUST is setting pace to match up the challenges in the field of Research through promoting and enhancing cross-cutting and multi-disciplinary research initiatives, diversifying external research funding and improving translation of research into the public benefit. ORIC plays its prospective role to reward faculty and researchers through Research Honorarium and assisting them to acquire research grants from various funding agencies. Capacity building is the topmost precedence of HEC. ORIC guarantee that technical workshops, seminars and business plan competitions are conducted on continual basis

so that students remain well equipped with modern tools and skills vital for the industry and corporate world.

Higher Education Commission expects ORIC Management in each university to work on research commercialization and help startups to incubate, create new jobs, products and services. ORIC at CUST has worked on establishment of CUST Incubation Lab and facilitation of Startups to inculcate the culture of commercialization and entrepreneurship. "Tech Flickers", "Al-Funoon", "Cafe-97", "Amazon Virtual Assistant Based Trading", "Tissue Culture Lab" and "Flex Tracker" are recent examples of some of the students Startups facilitated and funded by ORIC. We have awarded an amount worth 330,000 PKR to 11 projects over a period of 2 years that have sound marketing potential and commercialization aptitude. ORIC at CUST has maintained a comprehensive Research Database regarding Publications, R&D Projects, Donors/Funding Agencies and Industrial links in concurrence with HEC requirements.

HEC has mandated ORIC to create effective outreach with industry and commercial sector. In pursuit of academia industry linkage MOUs and mutual agreements are signed with various national/international organizations. A number of ventures are done with industry through mutual collaborations and joint projects. Industrial visits are being organized on continual basis. HEC ORIC Evaluation Matrix has due share for University's Research/Innovation/Commercialization Policies. Keeping in view its significance ORIC has developed University's Research, Training and Incubation Policies. ORIC at CUST is playing its potential role in facilitating university's research culture, promoting entrepreneurship, technology-transfer and commercialization, and strengthening university-industry relationships in accordance with HEC guiding principles.

Indigenous Development of Drone Detection Radar-A Research Proposal Submitted to Ministry of Education, Kingdom of Saudi Arabia

Drone technology has emerged as one of the biggest threats in ever-changing world of modern warfare, because they are readily available in the market and are more capable in carrying dangerous weapons on the board. The internationally available radar systems are expensive, our project proposes a cheaper and efficient Drone Detection Radar System which has a potential to penetrate in national and international markets. By indigenous manufacturing, a cheap and reliable Drone Detection Radar System can be manufactured and commercialized in local defense industry and also in International market. The proposed project provides an indigenous, low cost, economical and field worthy product of a Drone Detection Radar System avoiding the risk of cyber-security and jamming, and solving the critical problem of mitigating drones' intruders on government/corporate sites of critical nature. The research proposal is submitted to Ministry of

Education, Kingdom of Saudi Arabia in collaboration with Prof. Munawar Khalid, King Abdul Aziz University Saudi Arabia.



Internationally Won Research Grants and Collaborations by CUST Faculty

The faculty of Capital University of Science & Technology have recently won three International Projects/Research Grants of

481.404 Million PKR from European Commission. Prof. Amir Qayum, Dean External Linkages and International Collaboration (ELIC), accomplished two projects worth 169.92 Million PKR and 184.25 Million PKR respectively. Prof. Nayyer Masood, HoD Computer Science is part of a project worth 127.23 Million PKR.

| Sr. # | Project Title | Project Director/ Principal Investigator | International Collaborators | Approved Funding (PKR) |
|-------|--|---|--|------------------------|
| 1 | Strategic Support for Accreditation of Programs and Internationalization at South Asian Higher Education Institutes (HEIs) / SSAPI | Prof. Amir Qayyum | Portugal Germany Sri Lanka Maldives Bhutan | 169.92 Million |
| 2 | Capacity Building for Digital Health Monitoring and Care Systems in Asia - DigiHealth-Asia | Prof. Amir Qayyum | United Kingdom France Thailand Mongolia | 184.25 Million |
| 3 | Sensing Artificial Intelligence, and Edge Networking towards Rural Health Monitoring (SAFF-RH) | Prof. Nayyer Masood | France Scotland | 127.23 Million |

International Research Collaboration & Accomplishments

Erasmus Plus Capacity Building Project on Support for Accreditation of Programs and Internationalization at South Asian Higher Education Institutes (SSAPI)

Funded by: European Commission

Project Leader: Prof. Amir Qayyum (Dean External Linkages & International Collaborations (ELIC), CUST)

Funding Amount: 169.92 Million PKR



International Collaborators



- University of Evora Portugal



- University of Bremen Germany



- Sri Lanka Technology Campus (SLTC)
- University of Peradeniya (UoP), Sri Lanka



- Maldives National University (MNU)
- Villa College (VC) Maldives



- Royal University of Bhutan
- Khesar Gyalpo University of Medical Science Bhutan

ORIC Research Committee Meetings

The 13th ORIC Research Committee Meeting was held on October 06, 2020 and was chaired by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. The meeting started with the presentation of ORIC Activities Calendar Fall-2020 by Dean Research & Innovation before Research Committee members. He briefly explained the events and tasks intended by ORIC in current semester. He updated members about Research Proposals Status, Faculty Research Report Spring-2020 and newly launched Startups "Tech Flickers" and "Flex Tracker" and CUST Incubation Center (CIC).

The 14th ORIC Research Committee Meeting was held on December 01, 2020 and was chaired by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. The meeting mainly discussed the effective outreach of local industry especially pharmaceutical industry and the strategies to bring them on table for academia/industry linkages and commercialization.



Industrial Collaboration with Public Sector Strategic Organization

To extend research and development activities, Capital University of Science and Technology (CUST) and a Public Sector Strategic Organization joined hands together. An MoU was signed to foster a collaborative framework with a view to benefit from each other's initiatives and working procedures, and to support collaboration among the researchers associated with both the organizations. Dean Research & Innovation and Director HRD on 9th February 2021 officially signed the collaborative agreement for respective organizations.

Optimization and Establishment of In Vitro Cultures of Potato, Banana and Ornamental Plants for Commercialization: A Project of ORIC in Collaboration with Biosciences Department, CUST

The project is a joint Initiative of ORIC and Department of Biosciences, CUST. Plant Tissue Culture is one of the most rapidly growing areas of biotechnology because of its high potential to develop improved crops and ornamental plants. With the advances made in the tissue culture technology, it is now possible to regenerate species of any plant in the laboratory. Plant tissue cultures is associated with a wide range of applications, the most important being the production of pharmaceutical, medicinal and other industrially important compounds. The project involves wide range of research including study of new varieties of plants and seeds. Outcomes of the project will be documented in research journals and filing of National and

International patents. The knowledge gained in the process will help to produce projects at MS and PhD level. Commercially the project will help to establish a tissue culture supply chain of ornamental, banana, potatoes plants to various nurseries and vendors.

ORIC Certification Courses–Fall–2020

Continuing Education and Certification Courses help an individual to showcase his competency, commitment for the profession, build expertise in his professional area, and helps with job advancement. These courses not only provide training on various aspects of subject but also deliver detailed knowledge and skills required to perform real-world job responsibilities. Office of Research, Innovation and Commercialization offered semester long Certificate Courses in Fall–2020 for professionals and practitioners, who intend to develop on job skills and professional growth. The professionals from numerous organizations took keen interest and registered themselves for various courses.

Series of Workshops on Latex–A Typesetting Software

Latex is a Typesetting system suitable for producing scientific and mathematical documents which enable authors to typeset and print their work at the highest typographical quality. It is most often used for medium-to-large technical or scientific documents and can be used for almost any form of publishing. Keeping in view its significance, Office of Research, Innovation and Commercialization has started series of workshops to

maximally facilitate the students in their thesis write-up. The workshops were conducted on 21st October 2020 and 16th December 2020 respectively by Mr. Umair Rafique Research Associate, Electrical Engineering Department, CUST. The purpose of the workshops was to equip students with the most updated knowledge about creation of technical documents using Latex with practical illustrations.



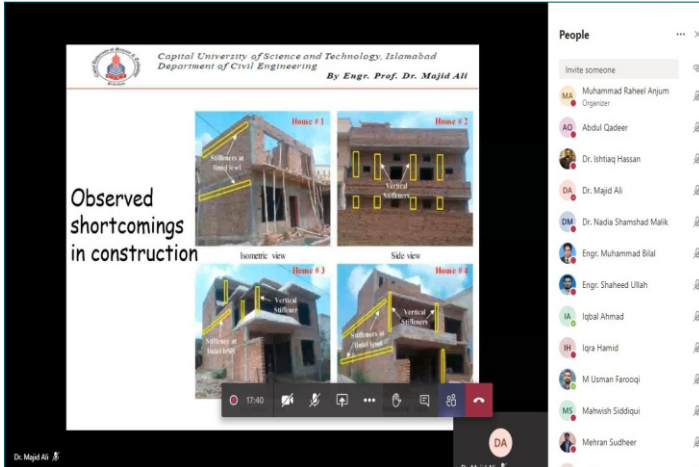
CUST PHD Repository and Research Posters

ORIC maintains a comprehensive database of PhD Graduates of CUST which includes all the details of PhD alumnus including name, thesis title, supervisor name and year. Till now 190 PhD's are graduated in various disciplines including Management & Social Sciences, Computing, Engineering and Health & Life Sciences. ORIC has also designed a standard PhD Poster Template and is responsible for coordination and revision of posters sent by students. It is requirement for every PhD student to submit a poster related to his research work to ORIC.

The objective behind the activity is to promote and acknowledge the research work done by the student and supervisor. The posters are displayed in the university to highlight the research output of each department. Till now a total of 70 posters have been displayed at the campus.

Inaugural Lecture of Prof. Dr. Majid Ali

Office of Research, Innovation and Commercialization organized the Professorial Inaugural Lecture to honor Engr. Dr. Majid Ali,



Professor, CE Department and Convener, University Health, Safety and Security Committee on 31st December 2020. The lecture was delivered on the topic entitled "Do We Live in Safe Housing? (From earthquakes point of view)".

The session started with a brief introduction of Prof. Majid Ali regarding his extraordinary academic and research achievements presented by Assistant Director ORIC. After welcome note and acknowledgement, the guest speaker was invited for the talk. The talk enclosed the conventional building techniques, and current practices followed worldwide for safe and earthquake resistant housing. The speaker discussed the subject in an extremely interactive and simpler way, understandable by participants across various academic backgrounds.

A total of 34 faculty members and research scholars from various departments attended the event. The event lasted for more than 1:30 hours including Q/A session. The response of faculty members was quite promising.

FYPs Business Plan Funding Competition

Office of Research, Innovation and Commercialization has continued its initiative of Final Year Projects funding for its Undergraduate students. The purpose of the activity is financial encouragement of students whose project ideas have particular business and marketing prospective. The event was advertised in the start of November, 2020 and the proposals for funding were received till 10th December 2020.



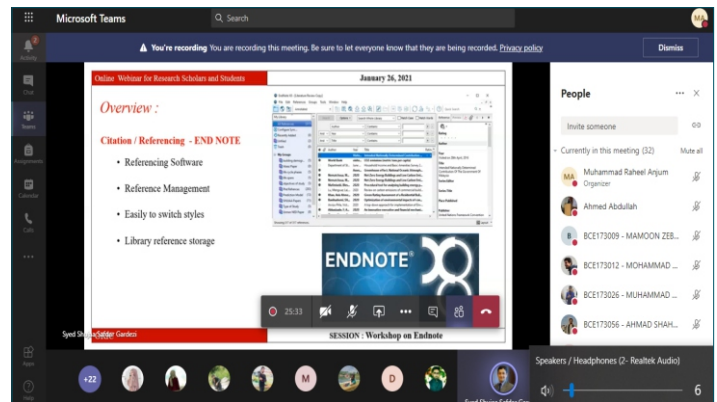
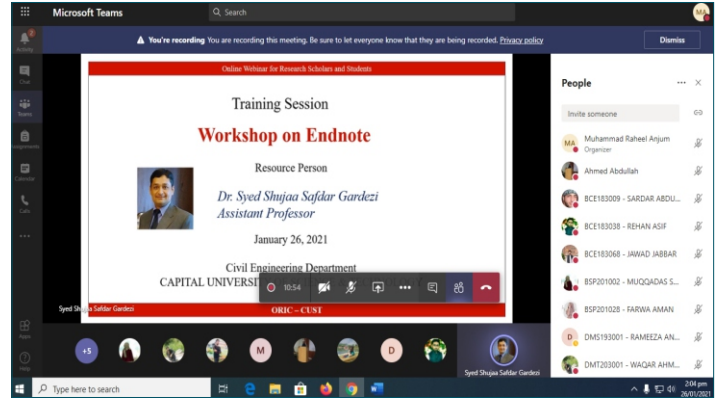
The evaluation and shortlisting of the applications was done by ORIC Research Committee Meeting. The committee evaluated the applications in accordance with the practical feasibility, business plan and marketability of each project. After a systematic analysis by Research Committee, top six projects were shortlisted for the funding encompassing 30,000 PKR each.

Meeting of ORIC with Directorate of Corporate Linkages (DCL)

Office of Research, Innovation and Commercialization and Office of Corporate Linkages conducted a meeting to extend joint industrial collaboration efforts. The meeting was held on 1st January, 2021 at Directorate of Corporate Linkages. Dean Research & Innovation chaired the meeting. It was discussed to devise a mechanism of Liaison with Strategic and Corporate Organizations with special focus on local Pharmaceutical Industry.

Workshop on Endnote–A Publishing software for Researchers

EndNote is a multiplatform software tool that helps you manage the process of writing and preparing research papers and thesis, and transfer and store references from electronic databases and library catalogues. It can easily be used to change styles, format a bibliography view and synchronize your library and work across devices. Office of Research, Innovation and Commercialization organized One-Day Workshop on Endnote on 26th January 2021. The purpose of the workshop was to educate participants with the most updated knowledge about Endnote and its use in the process of research papers and thesis write-up. The workshop covered some of the basic topics related to EndNote like Citation Components and Referencing Styles, Reference Management, Library Reference Storage etc. The workshop contents were augmented with practical demonstration on software. The session was conducted by Dr. Syed Shuja Safdar Gardezi, Assistant Professor CE Department and Director BIM Center of Excellence, CUST. A total of 35 participants including the faculty members, research scholars and students from various departments attended the workshop.



CUST Business Incubation Center

ORIC started Business Incubation Center under the name of CUST Incubation Center (CIC). The objective of center is to provide focused support to entrepreneurs through a supportive environment that helps them establish their business ideas and develop their concepts into market ready products. The SECP registered company "Tech Flicker" is the first ever incubated

company at CIC. Tech Flickers team comprised of experienced developers, graphics designers, content writers, SEO specialists, and digital marketers are driven to produce impactful results. The progress of the company is quite promising and has developed two of its own POS products. Other startups working at CIC are:

- IoT Based Power Control Devices
- Vehicle Management System (FlexTracker)
- Amazon Based Virtual Assistance



Collaborative Session with SJTU Representatives, China

To promote industrial linkages and move towards International Ranking, a joint session was conducted with Shanghai Jio Tong University (SJTU) representatives. The agenda of the meeting was focused on various factors playing role in international ranking and how to achieve those. Vice Chancellor CUST Dr. M. Mansoor Ahmed convened the meeting. Dean Research & Innovation, Dean Faculty of Computing, Dean Quality Enhancement Cell, HoDs of Mathematics, Mechanical Engineering and Computer Science Departments were also present in the meeting.



Consultancy Services for E&DC by CE Department

CUST comprehends the value of its faculty/staff undertaking consultancy for outside bodies. Consultancy is an important

channel through which knowledge and expertise can flow to and from businesses and other external agencies and therefore contributes to the development of growing and productive relationships with these bodies. Engr. Prof. Dr. Majid Ali, Department of Civil Engineering executed consultancy work for structural Evaluation of the Under Construction Commercial Building at Bahria Enclave, Islamabad.

Joint Collaborative Session with Enablers Pvt Ltd, Islamabad

To encourage students towards E-Commerce, Online Business and Digital Marketing, Office of Research, Innovation and Commercialization conducted a collaborative meet-up with officials of Enablers Pvt Ltd (E-commerce and Digital Marketing Agency). The meet-up discussed the significance of online business and E-commerce, and about how to motivate students to adopt to the changing business dynamics. An interactive session with CUST students was also agreed upon by Enablers team to update them about online business opportunities and relevant domains.

CUST Faculty Research Output Report-2020

ORIC compiled Faculty Research Report for presentation in meeting of Executive Committee. The research output of academic departments in 2020 was highlighted in a comprehensive way. The report thoroughly details the Number of Research Publications, Impact Factor, and MS and PhD students supervised by faculty members.



Construction Management Research Group

GROUP INTRODUCTION

Construction industry is one of the major economic pillars with direct relation with their performance and growth throughout the world. An efficient construction industry ensures the successful completion of its projects by not only achieving vital infrastructures but also through promoting sustainable development. The Construction Management Research Group seeks opportunities to explore core issues and problems faced by the construction sector at local as well as global level. This includes various domains related to the Construction Management, Project Management, Health and Safety Issues, Environmental Concerns, Energy Consumption Patterns, Green Rating Systems and application of AI to improve the construction processes. The main aim lies in presenting the sustainable development methods and solution to enhance the construction practices.

GROUP HEAD

Dr. Syed Shajiq Sadiq Gurbani

Dr. Syed Shajiq Sadiq Gurbani received his PhD in Civil Engineering (Construction and Project Management) from Department of Civil and Environmental Engineering, University Kebangsaan Malaysia (UKM), Malaysia in 2012. He has a diverse experience of more than seventeen (17) years including both professional industry and education sectors. Currently, he is serving as Assistant Professor in Department of Civil Engineering, Capital University of Science and Technology (CUST), Islamabad. He is involved in teaching and active researches supervisor at both graduate and undergraduate levels. His research work has been published in well-regarded journals and conferences. His projects also won achievement of various competition awards. Dr. Shajiq is a certified Building Information Modeling (BIM) professional and has been implementing BIM instruments at undergraduate as well as post-graduate level studies and research. He is also the founding member and current Director of BIM Centre of Excellence (BIM CoE) at Civil Engineering, Department, CUST. During his PhD, he was part of research program sponsored by Ministry of Higher Education (MOHE), Malaysia to develop a "Smart Integrated Low Carbon Infrastructure Model" for sustainable development using Building Information Modeling (BIM) under "Sustainable Resource Mission Oriented Research (SREMORO)", follow journal analysis he also covered as "Research / Issue Engineer" in "National Engineering Journal of Pakistan (NEJP)" for almost about a decade.

GROUP MEMBERS

Faculty Members

- Dr. Syed Shajiq Sadiq
- Eng. Abdul Qadeer
- Mr. Usman Hamid

PhD Students

- Eng. Shahid Kamal
- Eng. Jassid Tariq
- Eng. Sajjad Shaker Ullah
- Mr. Huda M. Bital
- Mr. Mustafa Sultan

MS Students

- Mr. Usayad Shajiq
- Mr. Tayyab Shaukat
- Mr. Wafa Nadeem
- Mr. Omer Muhammad

RESEARCH AREAS

- Construction Management and Sustainable Development
- Project Planning and Management
- Building Information Modeling
- Industry Revolution 4.0
- AI Applications in Construction Sector
- Energy conservation Patterns of Built Environment
- Construction Health and Safety Management
- AI Applications in Construction Processes

SELECTED RESEARCH THESIS/DESIGN PROJECTS

- Assessment of Potential Effects of CPEC on Development of Pakistan's Construction Industry
- Development of Economic Risk Factor Matrix for project Construction
- Impact Assessment of a Housing Scheme Considering Environmental Aspect of Site Viability
- Energy Optimization of a Residential High Rise Building using BIM for Sustainability
- Comparative Analysis of Green Building Rating Systems for Sustainability Assessment of a Residential Building
- Health and Safety Framework Using Analytic Hierarchy Process for Building Construction Projects in Pakistan
- Development of Correl Relationship of Cost and Viability of a Commercial Residential Building in Not Zero Energy Building
- Green Rating Assessment of a Building Project in Pakistan
- Energy Performance Analysis of a Multi-story Building using Building Information Modeling (BIM)

SELECTED PUBLICATIONS

Journal Publications

- A. A. Khan, M. U. Zaher, S. Anglin, and S. S. S. Gurbani, "Green rating assessment of a residential building in Pakistan using tool," *Open Journal of Science and Technology*, vol. 3, no. 2, pp. 126-130, 2020.
- S. S. S. Gurbani and N. Shafiq, "Operational carbon footprint prediction model for conventional tropical housing: a Malaysian perspective," *International Journal of Environmental Science and Technology*, vol. 14, no. 12, pp. 7917-7926, 2019.
- S. Nadeem, S. S. S. Gurbani, M. F. Nadeem, A. Zaman, and K. A. Wani, "Tropical carbon footprint assessment and forecasting for conventional housing in tropical region: A Malaysian case study," *Sustainable Progress in Sustainable Energy*, vol. 37, no. 2, pp. 829-834, 2019.
- S. S. S. Gurbani, N. Shafiq, N. A. W. A. Zaman, M. F. Khan, and S. A. Farhan, "A sustainable regression tool for reduced carbon footprint prediction in housing habitat," *Habitat International*, vol. 53, pp. 292-300, 2016.

Conference Publications

- S. S. S. Gurbani and N. Shafiq, "Prospects of a sustainable EOL - Carbon footprint assessment of a tropical housing habitat," in *10th International Conference on Civil, Offshore and Environmental Engineering (ICCEE)*, pp. 145-154, 2020.
- S. S. S. Gurbani and U. Hassan, "Sustainability assessment of a house by using LEED and Breeam," in *2nd International Civil Engineering Conference (ICCE-2020)*, p. 5, 2020.
- U. Hassan, S. S. S. Gurbani, and I. Hassan, "Sustainability rating assessment of a building using Carbon tool," in *The 3rd International Sustainability and Inclusive Conference*, pp. 1-4, 2020.

Book Chapters

- "Prospects of a Sustainable EOL-Carbon Footprint: Assessment of a Tropical Housing Habitat," *Proceedings of the International Conference on Civil, Offshore and Environmental Engineering*, Springer, Singapore, 2021.

Solutions To Energy & Environmental Problems (STEEP)

GROUP INTRODUCTION

The Sustainable Development Goals (SDGs) set in 2015 by the United Nations General Assembly are intended to be achieved by 2030. Pakistan too is a signatory of these SDGs that have made the world multi-disciplinary in all its facets. The research group entitled Solutions to Energy & Environmental Problems (STEEP) aims to address these facets via applied research towards providing sustainable solutions to global energy and environmental issues. The scope of STEEP includes areas such as Energy Distribution, Energy and Environmental Conservation and New Problems pertaining to forecasting towards the mitigation of Climate change and Food, Financial and Poverty crisis. STEEP is a multidisciplinary group that combines multiple faculties at CUST to bring together the best of futuristic and sustainable solutions. The overarching aim is to solve society's most urgent and pressing concerns. The group has published numerous research articles in the mentioned domains.

GROUP HEAD

Dr. Saira Ahmad

Dr. Saira Ahmad is currently the team lead for PEP International (Partnerships for Economic Prosperity) and is engaged with the COVID-19 response project for International Development Research Centre (IDRC), Canada. She is also the lead coordinator for Pakistan-Italy Network (PIN). One of the latest projects under PIN involves academic collaboration with Lazio Business School, Rome, Italy and Pakistan Poverty Alleviation Fund (PPAF). Dr. Ahmad has been involved in significant research liaison with Monash University, Australia and the Global Trade Center of Purdue University, USA, both of which have resulted in numerous funded research projects and training. At the Capital University of Science & Technology, she is the Director of the Directorate of Sustainability and Environment. She is also supervising research and teaches courses in Microeconomics, Macroeconomics, International Business and Environmental Impact Assessment.

RESEARCH AREAS

- Climate Finance
- Climate Risk Adaptation and Mitigation
- Assessing Environments for Sustainable Cities
- Environmental Impacts of Energy Technologies
- Global Atmospheric Chemistry and Climate Change
- Water-Energy-Food Nexus
- Sustainable Energy Systems and Networks
- Water and Power Distribution and Allocation
- Globally applicable Principles of Energy Policy and Techno-economics

GROUP MEMBERS

1. Prof. Asmer Iqbal Bhatti
2. Dr. Imtiaz Hassan
3. Prof. Majid Ali
4. Dr. S. Shajiq Sadiq
5. Dr. Arshid Amin Butt
6. M. M. Waheed Farooq
7. Ms. Shumaila Hashmi

CURRENT MS/PHD STUDENTS

PHD STUDENTS

1. Mr. Ahsan Haseeb (EE)
2. Mr. Shahmir Jaujan (CE)
3. Mr. Muhammad Hassan (CE)
4. Mr. Asam Awan (CE)
5. Mr. Waqas Zaid (CE)

MS STUDENTS

1. Mr. Samar Yamin (CE)
2. Mr. Khushid Wad (CE)
3. Ms. Tariq Khan (CE)
4. Ms. Aina Malik (MS)

SELECTED EVENTS

- Seminar on Youth Development Program by WWF (World Wide Fund on Nature)
- Seminar on The United Nations Humanitarian vs. Development System
- Special Talk of Director DSE, CUST on National News Network
- Awareness Session of Director(DSE), UCP about COVID-19 at Voice FM 97.6
- Celebration of Sustainability Week at CUST every semester
- Collaboration with LUNSS Business School Italy for Promotion of Sustainable tourism in southern Pakistan.
- Collaboration with LUNSS Business School Italy for "Chemical and Biological Analysis of Water in Southern Pakistan"

SELECTED PUBLICATIONS

Journal Publications

- S. Waqas, S. Ahmad, and I. Hashmi, "Climate FDI for Infrastructure Development in Africa: Assessing the Impact of cooperation," *Studies of Applied Economics*, vol. 39, no. 2, 2021.
- A. Haseeb, S. Ahmad, and I. Hassan, "Optimizing Pakistan's water economy using hydro-economic modeling," *Journal of Business & Economics*, vol. 11, no. 2, pp. 113-124, 2020.
- E. Asim and I. Hassan, "The impact of climate indices on precipitation variability in Baluchistan, Pakistan," *Tellus A: Dynamic Meteorology and Oceanography*, vol. 72, no. 1, pp. 1-6, 2020.
- S. Jaujan, I. Hassan, and S. Idan, "Role and relevance of three enabling conditions to resolve inter-provincial water conflicts in the Indus basin within Pakistan," *Water Policy*, vol. 22, no. 5, pp. 811-824, 2020
- S. Jaujan and I. Hassan, "Transboundary water allocation in critical scarcity conditions: a stochastic bankruptcy approach," *Journal of Water Supply: Research and Technology-AQUA*, vol. 69, no. 3, pp. 214-217, 2020.
- S. Jaujan, I. Hassan, M. Zaigham, and S. Idan, "Addressing the supply-demand gap in shared rivers using water diplomacy framework: utility of game theory in the Indus river within Pakistan," *Water Policy*, vol. 22, no. 5, pp. 790-810, 2020.
- S. Ahmad and M. Ali, "Use of agriculture waste as short discrete fibres and glass-fiber-reinforced-polymer rebars in concrete walls for enhancing impact resistance," *Journal of Cleaner Production*, vol. 268, p. 122211, 2020.
- S. Jaujan and I. Hassan, "Use of bankruptcy methods for resolving inter-provincial water conflicts over trans-boundary river: Case study of Indus River in Pakistan," *River Research and Applications*, 2020.
- S. Ahmad, S. Bhatti, and B. Abbas, "Making CPEC inclusive for informal workers," *Journal of Business Strategies*, 2020.
- A. H. Haseeb, S. Ahmad and A. I. Bhatti, "Impact of climate change on seasonal Flow of Rivers in Indus Basin and Hydro-Power Management: A Hybrid Approach (In-Progress)," 2021.

Conference Publications

- A. Haseeb, S. Ahmad, and A. I. Bhatti, "Using BIM for provincial water distribution," in *International Sustainable Development Conference*, 2020.
- A. Haseeb, M. Farhan and A. I. Bhatti, "Simulation and analysis of shilling oscillator using shilling mode control," in *International Conference on Communication, Computing and Digital Systems (C-CODE)*, pp. 326-330, 2017.

Capital University of Science and Technology

Off Kaak Pul, Sihala Road, Zone-V, Islamabad

UAN: (051) 111-555-666

<http://www.cust.edu.pk>