University of Central Punjab
Lahore, Pakistan 2002

Learning Innovation Centre

CLIMATE CHANGE RESEARCH COUNCIL

Climate Talks

First Edition- May, 2024

UCP Climate Change Research Council

(CCRC) Newsletter

Pro-Rector's Message

Climate Change Research Council Chair & Lead

Dear UCP Family,
Welcome to the Climate Change Research Council Newsletter, 'The Climate Talks!
As we continue to navigate the complexities of climate change, it's essential to stay informed about the latest research and breakthroughs in this critical field. Our council is proud to have 14 dedicated research ideas working tirelessly to advance our understanding of climate change and develop innovative solutions to mitigate its impacts.

The Climate Talks, shares updates from our researchers, highlighting their progress, achievements, and insights from their respective areas of focus. From exploring new renewable energy sources to understanding the effects of climate change on ecosystems, our researchers are pushing the boundaries of knowledge and driving meaningful change.

Through this, we aim to:

- Share the latest research findings and breakthroughs
- Showcase the dedication and expertise of our research teams
- Facilitate collaboration and knowledge-sharing among researchers and stakeholders
- Inspire action and engagement from individuals, organizations, and governments

I am optimistic that together, we can accelerate the transition to a more sustainable, resilient, and equitable future. Stay informed, stay engaged, and join us in the fight against climate change!

Sincerely,
Dr. Hadia Awan

Chair's Highlights

Integrating climate and development is a pillar of the World Bank Group's (WBG) Climate Change Action Plan 2021-25. To advance its implementation, the WBG has launched the Country Climate and Development Report (CCDR). This new core diagnostic tool analyzes how a country's development goals can be achieved in the context of adapting and mitigating climate change. As such, the Pakistan CCDR provides analysis and policy recommendations on how to harmonize the country's efforts to achieve further economic growth and lower poverty rates with the pursuit of a climate-resilient, low-carbon, and equitable development path.

The WBG recommendations for Pakistan are:

- **Transforming the Agri-Food System:**
  Productivity in the agri-food system – the largest employer, particularly for poor and vulnerable households – has been plummeting due to the degradation of land, overuse of chemical inputs and water, and lack of research. Yields are projected to drop another 50% by 2050. Pakistan needs to repurpose environmentally damaging subsidies, promote climate-smart regenerative agriculture and livestock systems, and prioritize ecosystem restoration to bolster rural incomes and strengthen food and water security.

- **Building Resilient and Livable Cities:**
  Pakistan's population living in urban areas is already highly exposed to pollution and climate change, it will increase from 37% in 2020 to 60% in 2050. Urgent reforms are needed for integrated land use planning, increased investments in municipal service, energy efficiency and clean transportation to ensure cities become more live able. To this end, strong municipal governments and the expansion of city finances via property taxation are imperative.

- **Accelerating a Just Transition to Sustainable Energy and Low-carbon Transport:**
  The energy sector is a critical enabler of economic development and poverty reduction. However, it is a burden on public finances and foreign exchange reserves, and a major contributor to GHG emissions. Pakistan must prioritize reducing generation cost by ensuring cost-reflective tariffs, improved subsidy targets while addressing technical, transmission and distribution losses. Scaled-up investment in mass transit can avoid polluting modes of transport.

- **Strengthening Human Capital to Achieve Sustained and Equitable Development and Climate Resilience:**
  Pakistan needs to address its human capital crisis by improving water sanitation and hygiene – a key factor of child stunting and high fertility rates. Pakistan should also ensure universal access to quality education and expand its social-protection system by improving benefits particularly for high-risk group.

Aligning Financing Policies, Incentives, and Institutions to Support Scale-up of Climate Actions: Implementing these policies and executing a climate-resilient and low-carbon development agenda will require an investment that amount to around 10% of the cumulative GDP till 2030. A large part of the needed investments can be achieved from the ongoing reforms: expanding domestic revenue mobilization, including raising new municipal and property taxes, as well as improving efficiency and targeting of subsidies for agriculture and energy while protecting the most vulnerable. Yet, it will not be enough.

Reference:

World Bank Group. 2022. Pakistan Country Climate and Development Report. CCDR Series;. © World Bank, Washington, DC. http://hdl.handle.net/10986/38277 License: CC BY-NC-ND."

CCRC Team

Ms. Zunaira Khalid
Head

Ms. Amna Khawar
Program Manager

Muhammad Sajjad
Coordinator

CCRC Volunteer Team

Ms. Sadia Zia
Project News Letter Editor

Dr.Saba Kabir
Project Activity Coordinator

CLIMATE CHANGE RESEARCH COUNCIL

Climate Change Research Council Projects

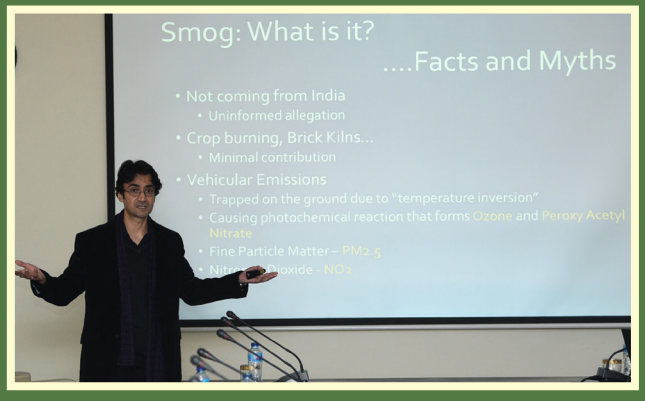
Call of Proposals:

LIC invited faculty members to submit brief proposals outlining their plans to research and tackle specific aspects of the climate crisis for CCRC. Proposals themes focused on a wide range of dimensions.

Project Themes:

1. Climate change impacts on local ecosystems.
2. Innovative technologies for environmental conservation.
3. Community-based adaptation and resilience strategies.
4. Policy recommendations for sustainable development.
5. Interdisciplinary collaborations combining relevant expertise.

The proposal call was opened from Dec 8, 2023 to Dec 18, 2023. A total of 14 proposals were received on the given themes. The principal investigators of these proposals were designated as the part of CCRC as members. CCRC is a collective vision of UCP for taking immediate measures on climate change.

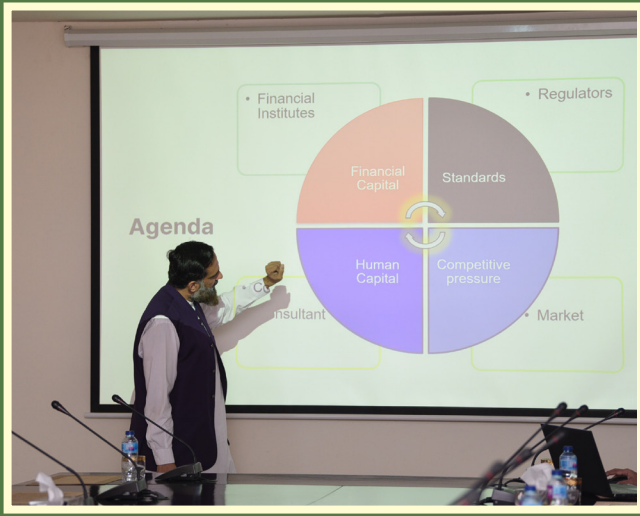


Monthly Spotlight

First CCRC Convention

The convention was held on December 28, 2023 at UCP. The convention was chaired by Pro-Rector UCP & CCRC Lead Dr. Hadia Awan. The convention aimed to develop harmony among all project investigators and their teams to correlate their research objectives. The convention also aimed to make the collective partners of research council for interdisciplinary collaborations.

The 14 projects were presented through 17 CCRC members along their teams. The presented projects were discussed thoroughly among members and suggestions were also made by Pro-Rector UCP for next step of CCRC.



CLIMATE CHANGE RESEARCH COUNCIL

Individual Projects

Awais Ur Rehman
(Assistant Professor-FOMS)
The action research proposal spearheaded by Awais Ur Rehman aims to **Comprehensively analyze and identify environmental sustainability best practices within the corporate sector in Pakistan.**

Dr. Raja Irfan Sabir
(Associate Professor-FOMS)
The research proposal led by Raja Irfan Sabir focuses on the **Critical intersection of environmental innovation and sustainable intelligence in Pakistan's hotel industry.**

Dr. Shabana Naveed
(Associate Professor-FOMS)
The research proposal aims to address the **Critical issue of climate resilience in Punjab, Pakistan, where the effects of climate change disproportionately impact vulnerable populations despite the country's minimal carbon emissions contribution.**

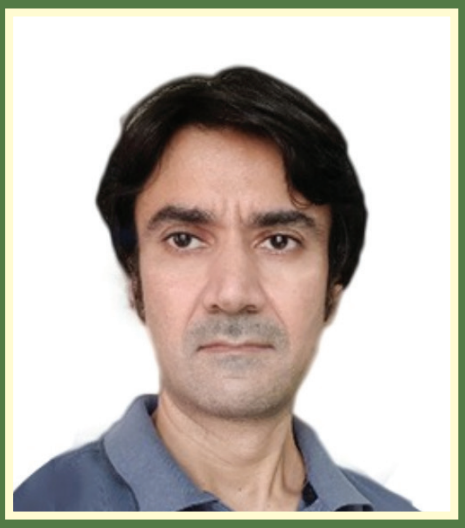
Dr. Sumera Zaib
(HOD-FOST)
The research project aims to address **The urgent global challenges of water scarcity and pollution by assessing the effectiveness of a novel wastewater treatment approach.** With the escalating discharge of heavy metals and antibiotics into water bodies, this study proposes the use of biochar derived from Phoenix dactylifera (date palm) loaded with nano zero-valent metals as a promising solution.

Mr. Kazim Ali
(Principal Lecturer-FOMS)
The research proposal **Sustainable Software Development and Coding Practices for Addressing Climate Change Crisis: Green Coding Initiative** aims to investigate current software development practices and devise strategies to enhance the sustainability of coding methodologies.

Sadia Zia
(Senior Lecturer-FOST)
The individual proposal titled **Community-Based Adaptation and Resilience Strategy for the Identification, Mitigation, and Communication of Dual Use of Research Concern (DURC) in Pakistan,** is a critical initiative to address the dual-use nature of social and biological research in Pakistan. Recognizing the potential harm in certain research methodologies, materials, or results, the project aims to enhance awareness and education around Dual Use Research of Concern (DURC) among the growing number of research institutes in Pakistan.

Dr. Muhammad Babur
(Assistant Professor-FOE)
The research project, titled **Causes of smog under climate change, impact on health in Lahore city, and the way forward,** addresses the escalating environmental challenge of smog in Lahore, a densely populated city grappling with the intricate interplay of local and global factors, including the influence of climate change. The study aims to comprehensively investigate the causes of smog, emphasizing the nexus between traditional sources of pollution and climate change impacts.

Dr Faisal Toosy
(Associate Professor-FOE)
The research problem addresses **The urgent need to address the winter smog crisis in Lahore, attributing it to climate change and inadequate monitoring technology.** The proposal aims to design a pilot network of air pollution monitoring nodes across Punjab, utilizing an Internet of Things (IoT) approach to measure various pollutants and meteorological parameters.



Dr. Tahir Saleem
(Professor-FOLL)
The research proposal titled **Shifts in Linguistic Patterns due to environmental changes: Implications for Cultural Preservation and adaptation strategies within affected communities,** addresses the under-explored intersection of language, environment, and culture. Led by a team of experts in linguistics, environmental science, and cultural studies, the research aims to unravel the complexities of linguistic shifts resulting from environmental changes and their broader impact on cultural preservation

Dr. Muhammad Umair
(Assistant Professor-FOIT)
The proposal titled "Harnessing Wave Energy in Pakistan: **A Deep Learning Approach for Potential Assessment** outlines a pioneering initiative to unlock Pakistan's untapped wave energy potential along the Arabian Sea coastline. Utilizing deep learning techniques, the project aims to construct a robust model predicting sea wave parameters, paving the way for a comprehensive assessment of wave energy potential across different coastal regions.

Group Projects

Lead: Dr. Muhammad Rizwan Shad, Dean (FoE)

Co-Lead: Dr. Muhammad Kashif (HOD-FOE)

The research proposal focuses on **The impact of biofuel blending and particulate filters on engine emissions and performance to facilitate the transition towards greener and cleaner engines, addressing critical issues in the transportation sector.** The primary research problem revolves around the potential health risks associated with particulate matter emissions from diesel engines, especially in major cities like Lahore, Karachi, and Peshawar. It aims to investigate the soot particles produced by burning biodiesel and diesel blends and assess the need for diesel particulate filters (DPFs) in Pakistan.

Lead: Sarosh Latif (Lecturer- FOLL)

Co-Lead: Dr. Shafat Yar Khan (Associate Honorary Professor)

The project **Engendering Environmental Responsiveness in Children by Using Eco- pedagogy: A Comparitive Study of Pakistani Public and Private School Curricula and Classroom Practices** addresses critical ecological challenges in Pakistan by implementing Eco-pedagogical methods to foster environmental responsiveness among students. Aligned with the Sustainable Development Goals (SDGs), the study focuses on public and private schools (Grade 6- Grade10) in Pakistan. The research aims to identify and analyze Eco-pedagogical approaches employed in these schools, assess the integration of environmental topics in curricula and classroom practices, and evaluate the impact on student awareness and social behavior.

Lead: Dr. Rizwana Kausar
Dean Faculty of Science & Technology

Co-Lead: Dr. Muhammad Akhyar
Professor of Chemistry

Areas	Names of the Faculty Members
1-Climate Change Impacts on Local Ecosystems	Dr. Muhammad Akhyar Farrukh, Dr. Nimra Afzal, Dr. Sadia Zulfiqar, Dr. Pervez, Dr. Saba Kabir, Dr. Nazish, Dr. Salma Batool, Dr. Madiha Khan.
2-Innovative Technologies for Environmental Conservation	Dr. Muhammad Akhyar Farrukh, Dr. Khalida Naseem, Dr. Tahira Shuja, Dr. M. Riaz, Dr. Kanza Aziz Awan, Dr. Akhtar Surrani, Dr. Snabil Yaqoob, Dr. M. Saad Tariq Mirza.
3-Community-Based Adaptation and Resilience Strategies	Dr Aatif Amin, Dr. Mohsin Gulzar Barq, Dr Tanzeela Riaz.
4-Policy Recommendations for Sustainable Development:	Dr. Muhammad Akhyar Farrukh
5- Interdisciplinary Collaborations Combining Relevant Expertise	Dr Rafique (Maths), Dr. Muhammad Akhyar Farrukh (Chem), Dr Kanza (Food Science), Dr Madiha (micro), Dr Nimra (Zoology)

Progress Series

Dr. Shabana Naveed
Associate Professor FOMS
has submitted the upcoming activities of her project for the next 6 months. Dr. Shabana's project was titled as "Fostering Climate Resilience: Bridging Administrative Gaps through Digitally Connected Governance Networks in Punjab, Pakistan." She is working on systematic literature review for first quarter of her project.

Ms. Sarosh Latif (Lead FOLL) and Dr. Shafat Khan(Co Lead FOLL)
have successfully finalized their surveys as part of their project resaerch methodology, and also obtained permission from both government and private sectors for conducting the surveys in schools. Their project is titled" Engendering Environmental Responsiveness in Children by Using Eco-pedagogy: A Comparitive Study of Pakistani Public and Private School Curricula and Classroom Practices

Dr. Muhammad Riaz &
Dr. Muhammad Perviaz
(FOST)
in the Lead of Dr. Rizwana Kausar & Co-Lead Dr. Akhyar Farrukh are working on "Enrichment of biogas produced using anaerobic bio-digester from fruit waste to decrease global warming and development of nanocomposite based sensors for sensing biogas leakage." From January 2024 to April 2024 Anaerobic bio digester has been made and installed as the roof of D Block building (University of Central Punjab). The banana peels were collected from University of Central Punjab's cafeteria. The banana peels were grinded and mixed with cow dung to add anaerobic microorganisms (methanogenesis).

Dr. Akhyar Farrukh is working on International Joint Project on Climate Change/Air Quality Monitoring in Lahore. The University of Central Punjab (UCP), Lahore signed the MoU on 26.09.2022 with Department of Environmental Health Sciences, School of Public Health, University at Albany, State University of New York, USA to work on the joint project "Air pollution monitoring of PM2.5 in Lahore to investigate the cause of smog and its effects on health". The cost of the project was PKR 4.21M funded by University at Albany. The project assembly was installed at Gate 04 Security Check Post, Building B, UCP. The project has been successfully executed and completed within time frame. The samples were collected during the smog season as well as after the smog season in year 2023 with 24 hours monitoring. The samples have been dispatched to USA for further analysis.

Equipment Installation

Sampling for Air Quality

1. Collection of Samples (First Phase): The samples were collected during the smog season from 14.11.2022 to 03.02.2023 with 24 hours monitoring including Saturday and Sunday. The samples have been dispatched to USA for further analysis.

2. Collection of Samples (Second Phase): We collected the samples after the smog season from 07.08.2023 to 21.09.2023 with 24 hours monitoring including Saturday and Sunday.

3. Analysis of Samples: The samples have been dispatched to University at Albany, USA for further analysis.

4. Journal Articles: 2 papers were published in collaboration with researchers from five countries, China, Nepal. Pakistan, Saudi Arabia, South Korea, Singapore.

Sadia Zia
Senior Lecturer FOST
is working on "Community-Based Adaptation and Resilience Strategy for the Identification, Mitigation, and Communication of Dual Use of Research Concern (DURC) in Pakistan," She has recently won the position in Technical Working Group for ISO 35001 Institutional Certification for Bio-risk Management with 2024-04 Amendment of Climate Action. The University of Central Punjab is among selected institutes in Punjab for the ISO 35001 certification.

Additionally she is also progressing with her research in compilation of BRM Curriculum development in a booklet format which will be available to selected universities for safe research practices envision the SDG 13. The curriculum ensures the safe research practices, secure research environment & capacity building for future research scholars. The project is supported by Association of Bio-risk Management Pakistan & Health Security Partners United States of America.

Dr. Raja Irfan Sabir
Associate Professor FOMS
is working on “critical intersection of environmental innovation and sustainable intelligence in Pakistan's hotel industry”. He has successfully carried out the literature review, theoretical model has been developed and tested and also published his article in Journal of Discover Sustainability-IF: 2.6 (https://doi.org/10.1007/s43621-024-00270-x)

Voice of Climate Activists

Dr. Zaigham Abbas
Director (Lab/NEQS)
Pakistan Environmental Protection Agency,
Ministry of Climate Change and Environmental Coordination
Government of Pakistan, Islamabad

There is no debate about this — climate change will most certainly impact the future generations. This global issue has the potential to take away everything we take for granted in this day and age. Our stable home will be flooded over. Our water will be dried out. Our crops won't be able to grow because of the increased heat. Our oxygen will be limited as deforestation continues. Our air will be dirty due to pollution; and most importantly, our future family will have harder and shorter lives.
I must congratulate University of Central Punjab Lahore for recognizing this issue at the Organizational level and working for it.

Hassaan Bin Saadat
International Climate Reality Leaders
University of The Punjab

Many congratulations on the publication of first Newsletter of UCP-Climate Change Research Council.
It's a fantastic initiative, Climate action is need of the time.We need to sensitize general public along with youth to take actions in our local communities on climate issues. Looking forward for joint collaboration in future.

Best of Luck UCP

CLIMATE CHANGE RESEARCH COUNCIL

Our mission: To protect and hand on the planet to the next generation.