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UNESCO Chair on Knowledge
Systems for Integrated Water
Resources Management
COMSATS – CUI
Wah, Pakistan

UNESCO Chair on Knowledge Systems
for Integrated Water Resources
Management (IWRM), CUI Wah Campus



Activities Report

Jan – Dec 2021



Highlights of upcoming Events

- Seminar on Ground Water
- Poster Competition
- Identification of Ground water Potential Survey



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Project Meeting on Satpara Lake Sedimentation and Climate Modeling

The project meeting was held on December 22, 2021 under the chairmanship of Director Campus/ UNESCO Water Chair on Knowledge Systems for Integrated Water Resources Management (IWRM), CUI Wah Campus , Prof. Dr. Muhammad Abid, T.I.,.

The meeting was attended by

- Dr. Mukhtar Ahmad, Assistant Professor, Department of Agronomy from Arid Agriculture University Rawalpindi,
- Dr. Muhammad Hasan Ali Baig, Associate Professor, Institute of Geo-Information & Earth Observation from Arid Agriculture University Rawalpindi,
- Dr. Munawar Ali Abbass, Assistant Professor, Department of Mathematics from University of Baltistan, Skardu.
- Dr. Zaheen Khan, Assistant Professor, Department of Geology from University of Baltistan, Skardu.
- Dr. Zakir Hussain, Assistant Professor, Department of Mathematics from University of Baltistan, Skardu.
- Dr. Salar Ali, Assistant Professor, Department of Environmental Sciences from University of Baltistan, Skardu.



This meeting was between the researchers from Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi (AAUR), the University of Baltistan, (UoB), Skardu and COMSATS University Islamabad (CUI) Wah Campus. Deliberations held on the planning taken to study the improvements in supply of irrigation water for Satpara Lake Sedimentation and Climate Modeling project as multidisciplinary team. It was also decided to submit a joint research proposal to some related funding agencies under UNESCO Water Chair on IWRM, PSF or HEC

Virtual Meeting on Artificial Rain Project



University of Bahawalpur (IUB), COMSATS University Islamabad (CUI) Wah Campus,

members from Pakistan Meteorological Department and Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi (AAUR). Faculty from the University of Baltistan, (UoB), Skardu joined the session. Meeting was chaired by Vice \Chancellor of Islamic University Bahawalpur Prof. Dr. Athar Mahboob. This was the second meeting held related to a mega project to discuss the Artificial Rain Project. Data collection, data analysis with respect of timings, intensity of rainfall, its potential to change the agricultural, social and economic situation of the region. Possibility of implementation of artificial rain discussed in length. The valuable suggestions were given by all members and it was decided primarily to focus on a selected regions of Bahawalnagar/Bahawalpur as a study and implementation site

.Following attended the meeting online:

- Dr. Muhammad Hanif, Chief Meteorologist from Research and Development, Pakistan Meteorological Department
- Dr. Furrukh Bashir, Deputy Director from Research and Development, Pakistan Meteorological Department
- Dr. Muhammad Ali Raza, Director, National Research Center of Intercropping from the Islamia University of Bahawalpur

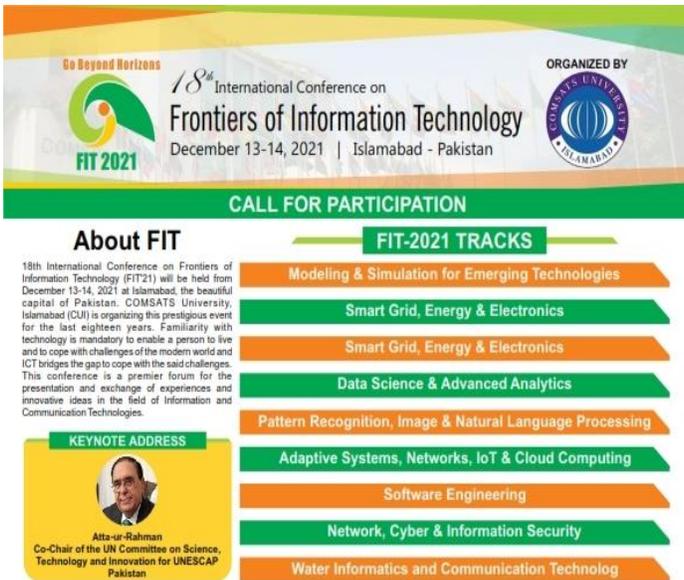
The members participated from CUI Wah Campus

- Director Campus/ UNESCO Water Chair on Knowledge Systems for Integrated Water Resources Management (IWRM), CUI Wah Campus , Prof. Dr. Muhammad Abid, T.I.,
- Dr. Mukhtar Ahmad, Assistant Professor, Department of Agronomy from Arid Agriculture University Rawalpindi,
- Dr. Muhammad Hasan Ali Baig, Associate Professor, Institute of Geo-Information & Earth Observation from Arid Agriculture University Rawalpindi,
- Dr. Munawar Ali Abbass, Assistant Professor, Department of Mathematics from University of Baltistan, Skardu and his team

Water Informatics and Communication Technical Session (December 13, 2021) at 18th International Conference FIT 2021 Islamabad, Pakistan

Water Informatics and Communication Technical Session was organized during 18th International Conference on Frontiers of Information Technology, held on December 13-14, 2021 at COMSTECH Secretariat, Islamabad, Pakistan under the umbrella of UNESCO Water Chair on Knowledge Systems for Integrated Water Resources Management (IWRM).

The session on December 13, 2021 included invited talk and research paper presentations. The invited talk on Underwater Acoustic Voice Communication and Demonstration was delivered online by Songzuo Liu, Harbin Engineering University, China.



The poster for the 18th International Conference on Frontiers of Information Technology (FIT 2021) is titled "Go Beyond Horizons" and "CALL FOR PARTICIPATION". It is organized by COMSATS UNIVERSITY ISLAMABAD. The conference dates are December 13-14, 2021, in Islamabad, Pakistan. The poster lists the following tracks:

- Modeling & Simulation for Emerging Technologies
- Smart Grid, Energy & Electronics
- Smart Grid, Energy & Electronics
- Data Science & Advanced Analytics
- Pattern Recognition, Image & Natural Language Processing
- Adaptive Systems, Networks, IoT & Cloud Computing
- Software Engineering
- Network, Cyber & Information Security
- Water Informatics and Communication Technology

A keynote address is featured by Atta-ur-Rahman, Co-Chair of the UN Committee on Science, Technology and Innovation for UNESCAP Pakistan.

The researchers presented following research papers and shared insights of their research;

1. Statistical analysis of time-varying channel for underwater acoustic communication and network by Honglu Yan, Tianlong Ma, Chenyu Pan, Yanan Liu and Songzuo Liu

2. Comparative Analysis of Magnetic Induction and Optical based Localization for Underwater Wireless Sensor Networks by Aman Muhammad, Qiao Gang, Muhammad Azeem Durrani and Muzzammil Muhammad

3. Indian Ocean Region Maritime Security: Technological Advancements and Innovative Solutions – Review by Muhammad Asim Ismail, Shahid Ali, Sartaj Khan, Zeeshan Babar and Muhammad Mazhar.

The whole session talks were very informative and acknowledged by the participants.





Seminar on “Satellite Enhanced Snowmelt, Flood and Drought Prediction for the Rivers with Surface and Groundwater Modelling” and Mathematical Modelling/Numerical Simulation of Health Monitoring of Water Resources against Sedimentation – Opportunities for the Application of Underwater Vehicles” at University of Baltistan, Skardu from October 23-25, 2021

Prof. Muhammad Abid, T.I., Director Campus / UNESCO Chair on Knowledge Systems for Integrated Water Resources Management, CUI Wah Campus visited University of Baltistan, Skardu from October

23-25, 2021 as expert on water resources, flood and drought predictions and as invited guest speaker to deliver seminar on “Satellite Enhanced Snowmelt, Flood and Drought Prediction for the Rivers with Surface and Groundwater Modelling” and Mathematical Modelling/Numerical Simulation of Health Monitoring of Water Resources against Sedimentation – Opportunities for the Application of Underwater Vehicles” The seminars were organized by the Department of Mathematics, University of Baltistan, Sakardu. HoDs, faculty, students and related industrial personnel of Mathematics Environmental Sciences, Geology, Biosciences and others attended seminars with interests.

Chairman, Department of Mathematics, Dr. Zakir Hussain Qamar in his opening address shared that university is working hard in fostering applied research to address real issues including but not limited to sedimentation in water resources, floods, droughts in collaboration with environmental sciences, geology, and other departments. Chief Organizer of the seminar Dr. Munawar Ali Abbas and organizing members Dr. Salar Ali and Ms. Saima Muhammad highlighted issues faced by Satpara lake, indus river, landslides, floods, ecology, snow melt etc. and expressed their concerns.

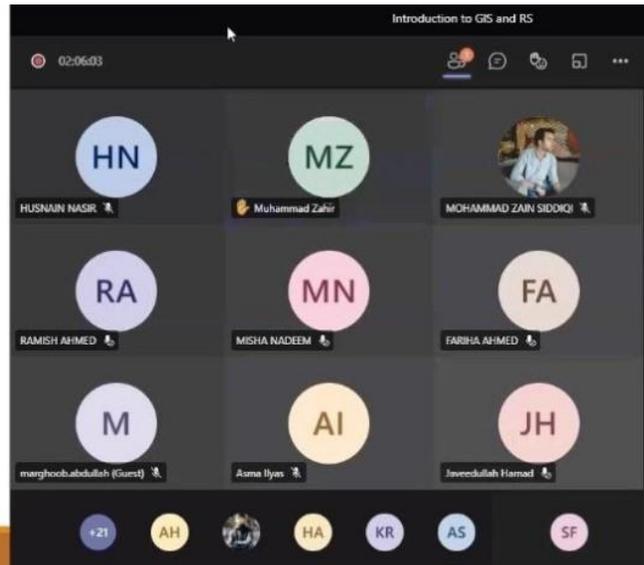
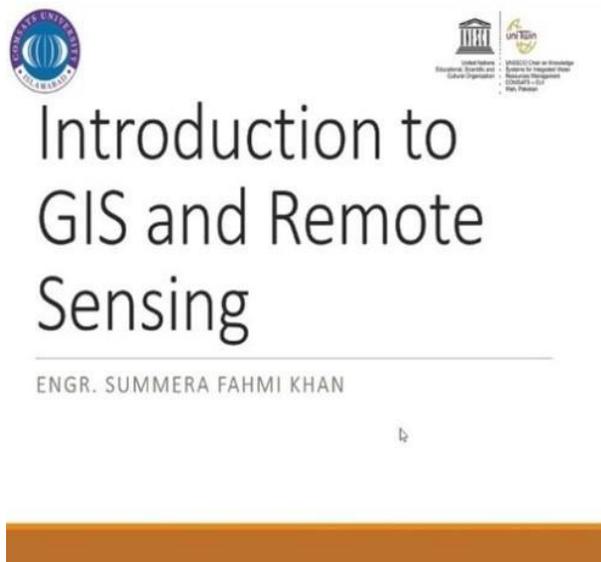


The UNESCO Water Chair in his talk appreciated the efforts of Department of Mathematics for organizing seminars, visits to Satpara lake and dam, flooding sites in Deosai and Shiger areas. During seminars he presented work done on Kabul River Basin as a case study and discussed its implementation for snow melt, floods, droughts, rain fall, surface and ground modeling as similar activities are needed to be planned and taken as a multidisciplinary team available at UoB in collaboration with national and international organizations. He also discussed in detail case study of sedimentation in water resources and tunnels and stressed to do research for their life predictions studies.

In addition, he had interactive meetings with the faculty and registrar of UoB followed by the visit to the university facilities. Various possibilities of mutual interest were discussed. Dr. Abid expressed gratitude to the organizers and administration of the University for inviting him and emphasized on supporting and promoting joint activities to strengthen future collaborations. At the end the Registrar, Mr. Waseem Ullah Jan Malik presented a souvenir to Guest Speaker, Dr. M. Abid.



Webinar "Introduction to GIS and Remote Sensing", CUI Wah Campus (July 28, 2021)



The webinar "**Introduction to GIS and Remote Sensing**" was organized under the platform of UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM) on July 28, 2021. The event started with the welcome note and introduction of UNESCO Water Chair activities and goals with aim of providing an effective platform for knowledge sharing. The main purpose of organizing the webinar is to create familiarity with GIS techniques through lecture and hands on exercises with basics of Remote Sensing.

The resource person member UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM), CUI

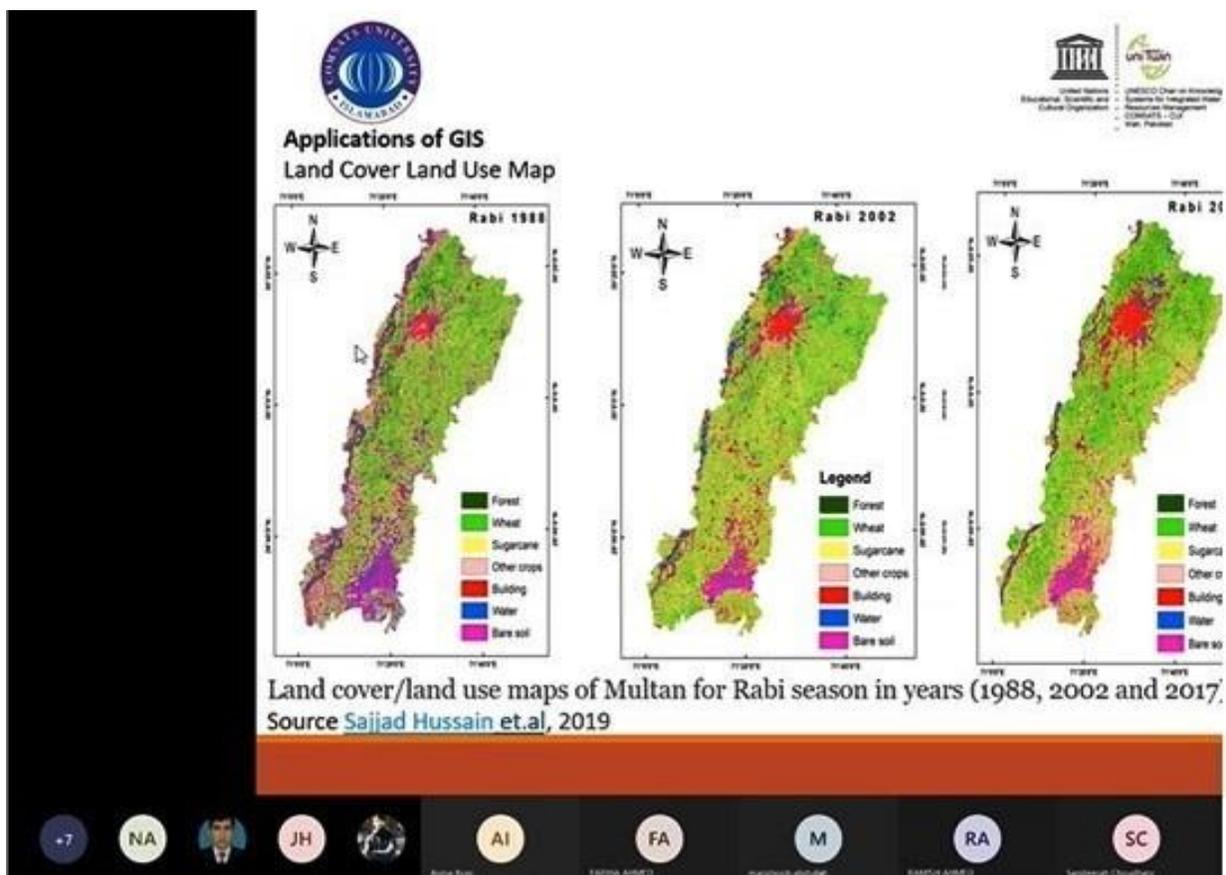
Wah Campus/Lecturer, Engr. Summera Fahmi from the Department of Civil Engineering shared her knowledge and expertise with participants. She conducted an interactive learning session with the demonstration of exercises by using open source QGIS applications. The Webinar covered the introduction of GIS and Remote Sensing Data, Vector and Raster Data symbology, analysis of data, area calculations, merging / clipping and visualization of data through creating own examples.

The researcher from the Center for Climate Research and Development (CCRD), CUI Islamabad Campus, Capital Development

Authority (CDA) Islamabad and NHA. Faculty Members from NED University of Engineering and Technology, Karachi, Abasyn University Islamabad, NUTECH Islamabad and COMSATS University Islamabad, Wah Campus. Students from the National University of Sciences & Technology, Islamabad (NUST), University of Engineering and Technology (UET) Taxila, University of Engineering and Technology (UET) Lahore and COMSATS

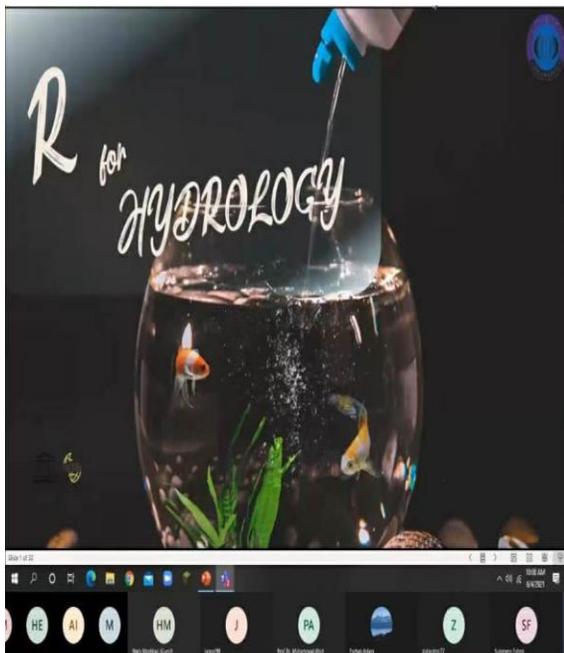
University Islamabad (CUI), Wah Campus participated in the webinar.

The UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM), Prof. Dr. Muhammad Abid appreciated the efforts of the resource person and the team of organizers on effectively conducting this course. The Chair also thanked all participants for their participation and making this event a success.



Webinar on “Introduction to R for Hydrology”, CUI Wah Campus (June 04, 2021)

The webinar to provide hands on training aiming to strengthen capacity building on “Introduction to R for Hydrology” was organized on June 4, 2021 by UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM) at COMSATS University, Wah Campus. New technology tools are rapidly emerging like R Programming Language of Data Science. By keeping its significance this warmup activity was arranged to engage youth to interact with an expert and gain advantage with his expertise in the field of Hydrology.



The resource person Dr. Zia ur Rehman Hashmi, having research experience in the field of Hydrology and Climate Change is heading the Water Resources and Glaciology Section at Global Change Impact Studies Centre, Islamabad, Pakistan and is doing work in mountain hydrology and glaciology in Pakistan. Dr. Zia conducted an interactive online training session including Introduction to R, Basic Commands and Functions of R, and explained R as cutting edge tool that enables seamless integration in hydrological workflow. He demonstrated Hydrologic Problems where R can help and R application in Hydrology.

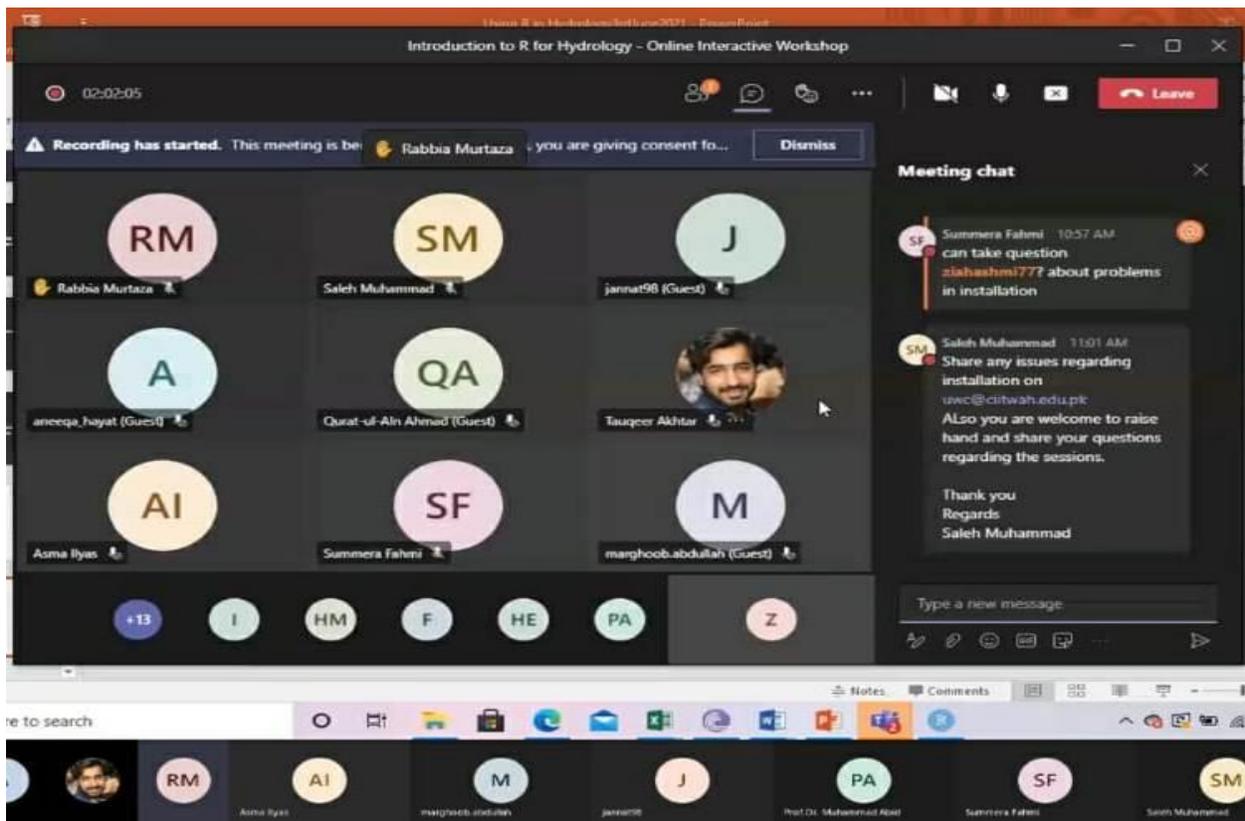
The professionals from IOM; academicians from Government College University Faisalabad (GCUF), COMSATS University Islamabad, Sahiwal Campus and Wah Engineering College (WEC); and Students from the University of Engineering and Technology, Taxila, University of Engineering and Technology, Lahore, COMSATS University Islamabad, Islamabad Campus and COMSATS University Islamabad, Wah Campus attended the webinar.

The Guest Speaker UNESCO Water Chair on IWRM, Dr. Muhammad Abid in his closing remarks thanked



Dr. Zia for taking out his valuable time and sharing his expertise with young blood who enthusiastically wants to get familiar with the

latest tool like R Programming Language. He emphasized that on account of scientific research and latest practices based on future predictions especially in climate change real time data modelling, graphical visualization and the hydrological modellers structuring would be done by using R language tool. He further motivated the participants to take part and hunt those learning opportunities to groom themselves for advancing in water and climate sciences. The Chair at the end thanked the organizers and ICE student chapter for their active contribution and making this event a success.



Webinar on “Restore Our Earth”

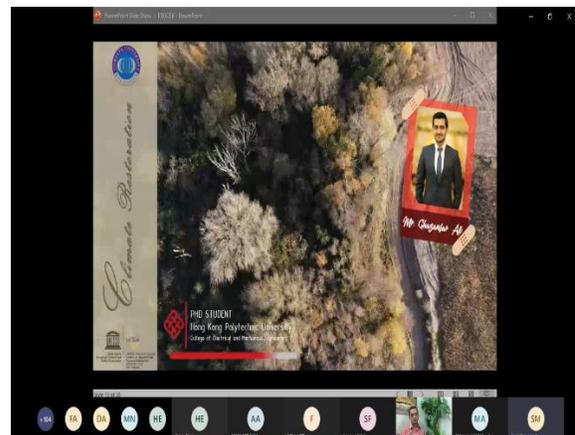


The webinar “Restore Our Earth” was organized online on April 29, 2021 through MS Teams to highlight the importance of our mother land by taking initiatives of saving the atmosphere from increasing heat-trapping emissions in air, fuel burning and industrial waste. The technologies, views and innovative ideas of participants from diverse fields of life were presented with the aim of spreading civic sense of saving the earth from climate changes and to remind the community that earth is providing life and sustenance and that each of us now has the responsibility of managing natural resources for the protection of earth. Measures taken to hold the land with the trust to keep land healthy for our future generation was deliberated.

The message of the UN Secretary-General was also presented which he delivered on April 22, 2021 on the recognition of Earth Day celebrations mentioning the protection and threats faced by our planet. To raise the importance of making environment clean

through green houses and measures taken to protect the environment with changes in weather patterns was presented through audio and video messages of participants.

The guest speaker Dr. Hassan Abbas presented his talk on the significance of water resources, earth system assessment, impacts of climate change and its vulnerabilities on natural and human environments.





More than 100 researchers, faculty members, students, school kids, freelancers, Govt and Private organizations

On the event the UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM) Prof. Dr. Muhammad Abid in his closing remarks emphasized on saving earth by adopting sustainable practices and its requirements for the people across the globe. As today's year theme "Restore Our Earth" focuses on natural emerging green technologies and innovative thinking that can restore the earth eco systems. The chair acknowledged the efforts of UNESO resource person Engr. Summera Fahmi (Lecturer, Civil Engineering) and her team on organizing webinar in befitting manner especially Mr. Saleh Muhammad (Vice President, Institute of Civil Engineers, CUI Wah Chapter) who hosted the webinar very professionally and made the audience involved in lively question and answer session. The Chair appreciates the resource person for his valuable talk and participants for their active

from Air University, Bahauddin Zakariya University, National University of Sciences & Technology (NUST), The Women University Multan, University of Engineering and Technology (UET) Taxila, University of Central Punjab (UCP), University of Swabi, University of Wah, Wah Engineering College, Hong Kong Polytechnic University, University of Cyprus, Capital University of Science & Technology (CUST), Swedish College, Fatima Jinnah University, University of Wah, Beaconhouse School, Roots International Wah, Sir Syed College Wah, COMSATS University Islamabad (CUI), Wah Campus, COMSATS University Islamabad (CUI) Abbottabad Campus and COMSATS University Islamabad (CUI) Islamabad Campus, organizers and UNESCO Members were actively attended and participated the webinar and sharing their ideas and views via Audio/Video recorded messages for making mother land earth greener and cleaner.

contribution. At the end the live interactive question and answer session was held. The whole event was conducted successfully.



One Day Workshop on Python Programming Fundamentals, CUI Wah Campus (February 25, 2021)

UNESCO Chair on Knowledge Systems for Integrated Water Resources Management, CUI Wah Campus organized one day workshop on PYTHON Programming Fundamentals on February 25, 2021 to engage young people with the aim to build capacity by strengthening young talent with latest programming tools such as Python. The Chair Prof. Dr. Muhammad Abid in his opening remarks briefed the role, past and future activities of UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM).

The resource persons Syed Anees ul Hassan and Muhammad Qasim delivered an interactive hands-on training on Python Syntax, Implementation, Guidelines, Loops, Conditional Statements and Built –in User-Defined Functions. Assistant Professor, Dr. Talha Akram from Department of Electrical and Computer Engineering, CUI Wah Campus discussed potential and opportunities of Python Programming Language in the field of Artificial Intelligence and Machine Learning.



Forty (40) participants including Faculty Members and Students from 5 universities i.e HITEC University Taxila, Wah Engineering College, Quaid-e-Azam University, University of Engineering and Technology Taxila and CUI Wah Campus attended workshop. Among participants 14 female participated, whereas 5 female actively participated as organizer in providing assistance to resource persons to conduct the practical work.



The Director Campus Prof. Dr. Sajjad A. Madani was the Chief Guest of the closing ceremony. In his remarks he appreciated the team efforts of organizing workshop in befitting manner for delivering knowledge under the platform of UNESCO Chair. He further encouraged the participants to think in a broader canvas to develop methodologies based upon the backgrounds and talents that they have.

In concluding remarks, the Chair thanked the chief guest, speakers, participants and organizers and motivated participants to further enhance their skills and getting exposure to the latest practices and techniques in the fast-changing arena of Information and Enabling Technologies in general and specific to the defined SDGs of UNESCO Water Chair on Knowledge Systems for IWRM. He mentioned that this is the first activity in 2021 and in future more such specialized courses including but not limited to R-Language, RS and GIS Tools and others will be organized. He also offered participants to work jointly as interdisciplinary teams to address SDG goals to benefit the Pakistani community in specific and global community at large.



The event was concluded on vote of thanks. At the end the Chief Guest presented souvenirs to Guest Speakers and Certificates to Participants.



Pakistan Water Week 2021-Poster Competition

The students of CUI Wah Campus and other universities under the platform of UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM), CUI Wah Campus participated in the poster competition held on December 08, 2021 at PCRWR during Pakistan Water Week 2021.

The aim of the event is to provide an opportunity to young students to communicate and highlight the importance of water and related emerging issues in a graphical form to create awareness among the audience.

Following students participated in the Poster Competition

Rida Malhi 1st Semester from the Department of Civil Engineering, CUI Wah Campus

Zoha Iqbal 8th Semester from Department of Computer Sciences, CUI Wah Campus

Muhammad Hammad 3rd Semester from Department of Mechanical Engineering, CUI Wah Campus

Nabeel Iqbal from Ibadat International University

Neelum Orooj MS Student from Department of Biosciences, University of Wah

The focal person Engr. Sumerra Fahmi along with the students actively participated in a poster competition and attended industrial exhibition of water related technologies followed by prize distribution and closing ceremony



Zoha Iqbal from the Department of Computer Sciences, CUI Wah Campus got first position in all Pakistan Poster Competition organized by PCRWR during Pakistan Water Week 2021.

The student Zoha Iqbal from the Department of Computer Sciences, CUI Wah Campus got first position in all Pakistan Poster Competition. Her poster theme was "Importance of Water in the light of Quran" which was acknowledged by all the judges.



Winning Poster by Zoha Iqbal

The UNESCO Water Chair/Director Campus Prof. Dr. Muhammad Abid, T.I., appreciated the efforts of all participants and the way they expressed their point of view of highlighting the importance of water to community.



In a closing ceremony held on December 9, 2021 all participants were awarded with acknowledgement certificates.



World Water Day – 2021, PCRWR Islamabad, (March 15, 2021)

UNESCO is celebrating World Water Day across the globe on March 22, 2021. The event was organized by the Pakistan Council of Research in Water Resources (PCRWR) Islamabad headquarter on March 15, 2021 to motivate and spread awareness on sustainable personal use of water and the availability of fresh water by highlighting this year's theme of "Valuing Water". The event was attended by the Engr. Summera Fahmi Khan, key member of UNESCO Water Chair.

The event was also attended by representatives from various organizations including United Nations Educational, Scientific and Cultural Organization (UNESCO) Islamabad, Australian Centre for International Agricultural Research (ACIAR), The Asia Foundation (TAF) Islamabad and International Centre for Integrated Mountainous Development (ICIMOD), Technology Times and RIPHAH Public Policy Institute.



In the event, various speakers addressed the audience on this year's theme i.e., Valuing Water.

The following issues were highlighted in the event

- Importance of water for our daily lives and well-being as well as cultural and religious practices.
- Involvement of youth in understanding water's true multidimensional value.
- Water management and water conservation
- Combine efforts at all levels to safeguard water resources for the benefit of everyone

At the end the winners of Essaycon Competition were rewarded with cash prizes and certificates and on research work submission students were awarded with certificates and shields.

International Webinar on “Air Pollution, Climate Change and their Impacts on Mountainous Water Resources”



An International Webinar on January 26, 2021, on “Air pollution, Climate Change and Their Impacts on Mountain Water Resources”, organized by the Department of Environmental Sciences, COMSATS University Islamabad (CUI), Abbottabad Campus.

Worthy Rector (CUI) Prof. Dr. Muhammad T. Afzal was the chief guest of the event. The moderators presented warming or cooling effects of climate changes on Agriculture and Industry. It was addressed that Water Cycle and many aspects of the economy, environment, and society depend upon water resources. The changes made in the hydrological resources its impact on

Prof. Dr. Fahim Khokhar from NUST, Islamabad, Pakistan, Deputy Director, Dr. Furrukh Bashir from National Weather Forecasting Centre Pakistan Meteorological Department, Islamabad, Pakistan were the speakers of the event. UNESCO Water Chair on Knowledge Systems for IWRM, Prof. Dr. Muhammad Abid and Lecturer, Summera Fahmi from Department of Civil Engineering as key member of UWC attended webinar.

environment, economic development and social well-being. The dynamics of mountainous water resources of Himalayan region on climate change was discussed.



Associate Professor, Dr. Alireza Noorpoor from Graduate Faculty of Environment, University of Tehran, Iran, Associate Professor, Dr. Lekhendra Tripathy from state Key Laboratory of Cryospheric Science, Northwest Institute of Eco-Environment and Resources, Chinese Academy of Sciences, Lanzhou, Gansu (China), HoD Institute of Environmental Sciences and Engineering (IESE)