



Representatives of MoNHSR&C, Government of Pakistan, WHO Pakistan, and COMSATS Telehealth, at the closing of training workshop on SRH for telemedicine providers (details on page 4).

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From the Executive Director's Desk

Since late 2019, Goal 3 of the UN's 2030 Global Agenda has rightfully risen to the highest significance due to the outbreak of COVID-19 that took the whole world by storm in a matter of weeks to become the biggest modern day pandemic. During the first half of 2020, the world exhibits a whole spectrum of stories and experiences of tackling with this global menace. From lockdowns relaxed owing to reportedly reduced to some awaiting gradual or sudden peaks, countries have come a long way in dealing with it. China, New Zealand, and Australia, stand out with their success in mitigating the havoc caused by the pandemic. Some other countries are trying to follow suit, and having relative success, but many, especially the developing countries seem to be struggling more. A few obvious comparative advantages that have been aiding good pandemic response are the ones that are important to development of any kind; systems and systemic approaches; good governance and implementation; investment in education, civic sense, and science technology and innovation, to name a few. These may not have been the sole reason for a better response, but surely provide the baseline and grounds for it.

The existing terms and dynamics of international cooperation, sustainable development and globalization are evolving very quickly. In some cases, the dilemma of survival for all and need to sustain economic growth provides some very bleak pictures. Governments, especially those

of developing countries are in a fix and facing some very hard decisions now and for the future. Fortunately for the world, we live in the times of science, technology and innovation that is coming to our aide at a fast pace. While the health workers are fighting the pandemic with the technological advantage the current age offers, scientific research and development is coming to aide societies from the microscopic aspects of the disease and its treatment to the ones relating society and economy. The pandemic has given the world a stark reminder to invest heavily in S&T and education. It has necessitated: digital revolution in all sectors; innovation-led and digital solutions; reinforcement of healthcare infrastructure; greater investment in R&D; harnessing the power of fourth industrial revolution for meeting national demands as well as building resilience against future shocks. The Newsletter features an article highlighting the significance of COVID19 in this digital age.

As the pandemic necessitated the use of digital tools in every sphere, more people turned to telehealth facilities for primary healthcare services. In this backdrop, COMSATS in collaboration with WHO organized training for capacity building of telehealth providers, the details of which are covered in the pages of this Newsletter.

We look forward to receiving feedback and suggestions for improvement in future issues of this Newsletter.

HIGHLIGHTS FROM COMSATS SECRETARIAT

Meeting with the Chairperson COMSATS Consultative Committee

Dr. S. M. Junaid Zaidi, Executive Director COMSATS, called on H.E. Mr. Fawad Chaudhry, Federal Minister for Science and Technology (MoST), Government of Pakistan, at his office, on 24th June 2020. The key agenda of the meeting was to apprise the Honourable Minister – ex-officio Chairperson of COMSATS Consultative Committee – about COMSATS’ recent undertakings aimed at scientific and technological growth and advancement of its Member States, including Pakistan.

Capt. (R) Nasim Nawaz, Secretary MoST; Dr. Hussain Abidi, Member (Science and Technology), MoST; and Dr. Ahsan Feroze, Director (IL), Pakistan Science Foundation, were also present during the meeting along with Mr. Bilal Chohan (Director of Admin & Establishment) and Mr. Farhan Ansari (Sr. Assistant Director Programmes) from COMSATS Secretariat.

After his presentation on COMSATS, Dr. Zaidi shared with the Minister the future aspirations of the Organization. The Minister was informed that COMSATS plans to capitalize on its experience in the deployment of Information and Communication Technologies (ICTs) for achieving socio-economic benefits by way of the following:

- Establish an Innovation Lab in Islamabad;
- Develop a Distance Learning Support Network;
- Set-up 50 Rural Telehealth Clinics in Pakistan; and
- Establish higher education institutions in other Member States on the lines of its flagship project, i.e., COMSATS University Islamabad.



Mr. Fawad was appreciative of COMSATS’ endeavors for promoting science-led sustainable development in the South. He recommended scaling-up COMSATS Telehealth Programme within Pakistan and also expanding it to other Member States of COMSATS.

The Minister hoped for enhanced cooperation among COMSATS’ Member States particularly in the areas of agriculture, electronics and chemical sciences.

Torch Hi-tech Industry Development Centre, MoST, China

A virtual meeting between COMSATS’ officials and the Torch Hi-tech Industry Development Centre of the Chinese Ministry of Science and Technology (MoST) was held on 3rd June 2020.

The meeting was arranged to benefit from the expertise available with the Torch Centre for the establishment and management of S&T Park on Biotechnology in Pakistan.

The meeting was attended by Dr. S. M. Junaid Zaidi, Executive Director COMSATS; Mr. Mo Tan, Director of the Division of International Cooperation, Torch Centre, Chinese MoST; as well as other senior officials of COMSATS and Torch Centre.

During the meeting, Gen. (R.) Muhammad Tahir, Advisor (China Desk), COMSATS, appreciated the help being rendered by China to Pakistan for dealing with the current coronavirus and locust crises. He considered China’s good practices and experience in the field of agriculture important for Pakistan and other COMSATS’ Member States in battling impending threat to food security.

Gen. (R.) Tahir informed that modalities have been worked out for the construction of S&T Park on Biotechnology in Jhelum, Punjab province of Pakistan. He stated that the S&T Park would be based on the model of one of the Centres of Excellence of COMSATS, i.e., the Tianjin Institute of Industrial Biotechnology (TIB), China, with pharmaceuticals, agriculture, green textiles and biosciences spheres as major areas of focus.

Appreciating this initiative, Mr. Mo Tan considered the working areas of S&T Park most pertinent to the emerging global needs and assured support of Torch Centre in this connection. He gave a detailed overview of the working of Chinese Science and Technology Parks and explained their various facets. In this regard, Mr. Tan shared the Torch Centre’s role in policy making and management of S&T Parks in China.



He extended offer of participation to stakeholders from Pakistan in Torch's annual workshops on planning, construction and management of S&T Parks for knowledge-sharing and capacity development.

Dr. Zaidi appreciated the offer of support by Torch Centre to facilitate the establishment of S&T Park in Pakistan.

International Webinar on the Role and Challenges of Youth in Global Crisis – COVID-19

An international webinar to mark National Youth Day of China was organized by COMSATS on 4th May 2020. The webinar, titled "Role and Challenges of Youth in Global Crisis – COVID-19", was aimed at realizing the transformative role being played by youth in numerous settings and spheres for the effective translation of various targets of United Nations Sustainable Development Goals (SDGs); and suggesting ways to apply youth's potential to help deal not only with the current coronavirus pandemic but also with looming global threats and challenges to sustainable development, such as climate change.

In his opening remarks, Dr. S. M. Junaid Zaidi, Executive Director COMSATS, considered the role of

youth imperative in finding innovative solutions to combat the current crisis and underscored the need for collective action to oust coronavirus. COMSATS, he added, could provide an effective platform to youth for presenting their ideas to help address global issues.

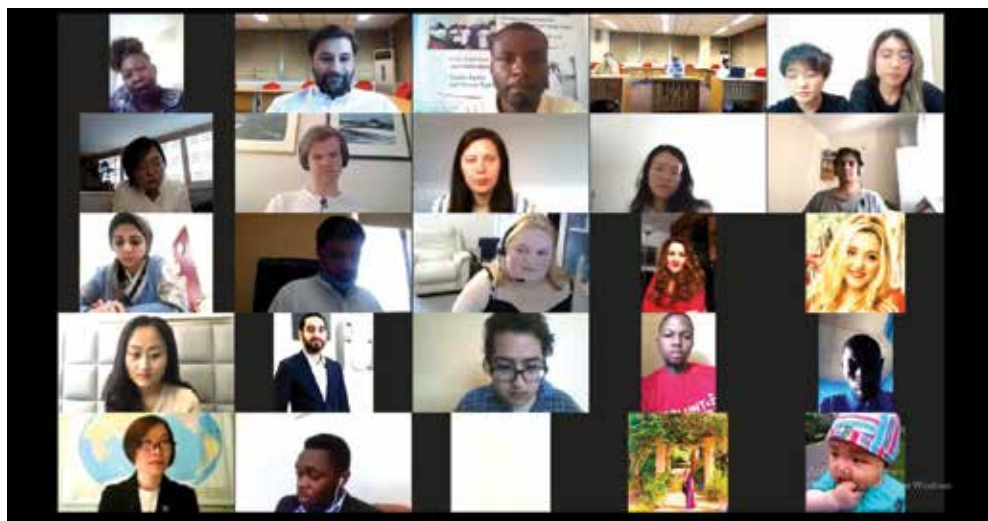
The webinar was moderated by Ms. Nafula Wafula, Co-founder of Tunawiri (The Grassroots Gender Justice Network) and Vice Chairperson in Charge of Policy and Advocacy at the Commonwealth Youth Council and featured remarks and views of the following international experts, young leaders and entrepreneurs from over 15 countries: Dr. Mary Drosopoulos, Founder & President of Eurobalkan Youth Forum, Greece; Dr. ZHENG Yue, Program Manager of International Department at All-China Youth Federation, China; Ms. Liu Jian, Co-Founder and Board member of Ichi Foundation, China; Ms. Lama Shashaa, Co-founder and Chairwoman of International Robotics Academy, Jordan; Mr. Bochum Samuel Bache, Country Head of Cameroon Chapter of COVID 19 Youth Task Force; Mr. Christopher Christian Seagateng, Country Head of Botswana Chapter of COVID 19 Youth Task Force; Mr. David Naboare, Coordinator at African Covid-19 Youth Task Force, Ghana; Mr. Reşit Yusuf Akbal, Board member of Young MUSIAD, Turkey; Ms. Miram

Wafik Elgendy, Founder of Humans for Development Community, Egypt; Ms. Linzi Stewart, Vice Chair of Rural Youth Europe from Northern Ireland, United Kingdom; Mr. Fredrik Asche Kaada, Expert on Sustainable Solutions and Clean Energy, Norway; Ms. Xin Pengda, China Youth Center for International Exchange, China; Mr. Stephen Kemali, Kenya; Mr. Maximillian Godwin Kilipamwambu, Tanzania; Ms. Rose, South China University of Technology, China; Ms. Huang Zhao, China; and Ms. Diana, Switzerland.

During the webinar, country responses to COVID-19 and youth's role in dealing with the crisis were recorded by different participants. China's remarkable success in containing the spread of COVID-19 as a nation was lauded and the significant role that Chinese youth played in increasing awareness about disease prevention and control was regarded exemplary.

It was suggested that S&T education should be incorporated as a fundamental component of curricula from primary level to help build youth's capacity in various technical spheres. It was opined that shift to digital tools and methods can help solve the rising youth unemployment challenges.

Further during the webinar, online



education and learning during the pandemic was highlighted as a challenge for countries with resources constraints many of which, such as Tanzania, are facing serious issues in continuing the education in the present scenario.

The participants also presented various ideas on solutions to cope with the ramifications of the corona pandemic. Green economy was considered as a sustainable instrument to handle social, environmental and economic fallouts of the pandemic. Online sharing of experiences, knowledge and best practices relating to mitigation strategies and coping mechanisms were valued as important elements for generating integrated response to corona pandemic.

Closing the webinar, the coordinator of the activity, Engr. Qaiser Nawab, Assistant Director (Programmes) COMSATS, gave the closing remarks. He stated that youth can bring a substantial change in the society. He stressed upon due investment in young population and urged global youth to come forward with different innovative ideas to serve humanity and address emerging global challenges.

Virtual Training on Sexual, Reproductive and Maternal Health (SRH) For Telehealth Providers

COMSATS in collaboration with the World Health Organization (WHO) Pakistan and the Ministry of National Health Services, Regulations and Coordination (MoNHSR&C), Government of Pakistan, is organizing virtual trainings on Sexual, Reproductive and Maternal Health (SRH) for skill development and capacity building of professionals providing healthcare services through various Telemedicine platforms within Pakistan. The need for such training was realized in the wake of increased need of digital health as a tool to cater the healthcare needs of the population as some OPDs of tertiary care facilities in far-flung areas were closed, travel restrictions were put in place and many areas are under lock down due to COVID-19 pandemic.

The first of these trainings was organized for doctors from 8th to 12th June 2020, that benefitted fifteen (15) telehealth providers from COMSATS, Sehat Kahani and Human Development Foundation (HDF) telemedicine platforms.

All the content of the training was designed with special considerations to COVID-19 to ensure provision of quality healthcare services to the pregnant women amid the pandemic.

Opening Session

In her opening remarks, Ms. Ellen Thom, Technical Officer, Reproductive Health at World Health Organization (WHO) Pakistan, welcomed the participants and considered telehealth as an effective tool for provision of healthcare services in these challenges times of COVID-19 pandemic. In view of this, she added, current training has been arranged to provide better understanding of the subject and to build capacity of telehealth professionals.

Technical Sessions

The training initiated with a pre-assessment test of the participants by Dr. Qudsia Anjum, National Professional Officer Maternal, Newborn, Child and Adolescent Health, WHO Country Office Pakistan. Subsequent to the assessment, Dr. Anjum introduced whole training program and also familiarized the participants with an evaluation form to be filled-in at the end of the day.

The master trainer for the first day, Dr. Samina Naeem, a senior consultant Sexual and Reproductive Health with WHO Pakistan, gave an overview of Sexual and Reproductive Health status in Pakistan.

She shared World Health Organization's guidelines on antenatal care, its recommendations and new concepts introduced in these guidelines for antenatal care. She informed that these guidelines have been divided into the following groups: nutritional interventions, maternal and fetal assessment, preventive measures, interventions for common physiological

symptoms and health systems interventions.

The participants took keen interest in Dr. Naeem's presentation as antenatal care is one of the most important areas that is being catered through digital health services. The presentation was followed by a Q&A session during which participants' concerns regarding various aspects of antenatal care were addressed by the master trainer.

The following three days of the training provided thorough insight to the participants into the basic SRH content

The third day of training was dedicated to the post-natal management, and maternal and childcare. Dr. Samina Naeem trained the participants on postpartum care as per official WHO guidelines specifically highlighting emergency situations where patients may need referral and post-partum depression management.

Dr. Naeem also talked about gaps between local beliefs and prescribed medical practices in some areas of Pakistan that negatively affect postpartum and postnatal care. Further, she also prescribed ways to address

psychologist running Sobia Khateeb Foundation, shared some tips for effective stress management of the pregnant and post neonatal women especially in connection with the current COVID-19 crisis. She also considered stress management important for good mental health and better performance at work.

During the last session of the day 3, participants were apprised about telemedicine and its applications within Pakistan by Ms. Lubna Mir, health informatics expert and Assistant Professor at Computer Sciences department of Air University, Islamabad. During her presentation, Ms. Mir also shared some insights on data sharing analytics in connection with telemedicine and health informatics.



along with quick revisions of the basic knowledge followed by special focus on the WHO recommendations according to latest scientific evidences and research.

The second day of the training was conducted by Dr. Nusrat Shah, a Gynecologist serving as Professor in Dow Medical College and Civil Hospital in Karachi. Her presentation focused on routine care in labour, delivery and immediate post-partum care as per guidelines provided by WHO. Dr. Shah also discussed intra-partum management in view of contemporary trends in maternal healthcare in labour.

challenges relating to unreliable data on infant and maternal mortality. Participants were also familiarized with newborn care after delivery by means of a demonstration video.

During the session, queries pertaining to considerations regarding infant and maternal health amid corona crisis and challenges of working at Basic Health Units (BHUs) in remote areas were also addressed by the trainers.

A session on stress management with respect to post-partum stress as well as the psychological issues in healthcare workers due to COVID-19 was also a part of third day sessions. During this session, Dr. Sobia Khateeb, a clinical

Fourth day of training was marked with extensive information presented by Dr. Nusrat Shah to all participants on family planning issues and methods along with post abortion care to be provided to the female patients. Dr. Nusrat also imparted knowledge on adolescent health and issues faced at the crucial adolescence age that sometimes leads to psychological and social issues. She also shared information on methods of contraception and considered family planning important for achieving various targets of United Nations Sustainable Development Goals. Her presentation was followed by a demonstration on post-abortion care by the trainer on dummy figures and instruments.

The final day of the training was dedicated to the novel coronavirus response and preparedness. Dr. Badar Munir, National Professional Officer at WHO Sub-Office Sindh presented basic features and symptoms of the virus followed by information on methods for infection prevention and control measures. He also shared good practices on the use of Personal Protective Equipment (PPEs) as



recommended by WHO and other preventive measures to be taken by the reproductive and maternal health professionals within the context of COVID-19. Dr. Munir also acquainted the participants with the principles and methods of cleaning and disinfection; proper management of hospital waste; and safe practices for the burial of COVID-19 patients.

Later, Dr. Qudsia Uzma gave orientation to the participants on SRH self-care interventions recommended by WHO and that can be advised by health professionals to the patients.

Closing Session

The brief closing ceremony of the event was graced by the presence of Dr. S.M. Junaid Zaidi, Executive Director COMSATS; Dr. Palitha Mahipala, WHO Country Representative in Pakistan; and Dr. Malik Muhammad Safi, Director General Health at MoNHSR&C.

Dr. Atiya Aabroo, Deputy Director (Programmes) at MoNHSR&C presented a recap of the whole training, including introduction of the presenters, various topics covered and overall scheme of the training. Representatives from three participating organizations, i.e., COMSATS, Sehat Kahani and Human Development Foundation (HDF) shared their positive feedback and experience

about the training at the closing session.

Speaking on the occasion with the participants virtually attending the training, Dr. Zaidi established telemedicine as the need of the hour and offered COMSATS' technical support to Pakistan in this regard. He greatly lauded the role of doctors and healthcare providers working on the frontlines in the current coronavirus pandemic and considered them great asset of nations.

In his remarks, Dr. Palitha, considered the present training significant in underscoring the various aspects of maternal health and childcare which is being compromised due to COVID-19 pandemic. Underscoring the increasing role of technology in current times, he regarded telemedicine the new normal. Dr. Safi in his keynote address opined that telemedicine could help address the current gaps in the health systems which are currently under stress due to coronavirus pandemic. He appreciated CTH for providing healthcare services to marginalized communities through digital means for almost two decades.

The session ended with the vote of thanks by Ms. Ellen Thom in which she appreciated the efforts of the organizers and hoped that the knowledge and skills imparted during the training would help the participants better deal with

challenges in provision of healthcare services through digital means.

Impact and Outcomes

All technical sessions of the virtual training were supported by videos, interactive comments and Q&A sessions that helped build better communication and rapport between the trainers and participants.

The training:

- Provided the participants an opportunity to upgrade the knowledge and skills of the doctors who are providing maternal health services to the vast rural community throughout Pakistan;
- Allowed them to get informed about the new concepts, techniques in the SRH and a recap refresher of the older ones still in use;
- Provided a package of care from prenatal period to post-natal care of the pregnant women along with the other aspects of women's health on the whole.

Although the training was provided through online link, the participants found this mode of training very effective. The knowledge of latest concepts recommended by WHO imparted during the training is expected to help doctors in enhancing the quality of healthcare in the rural areas where the existing healthcare practices are dominated by old, outdated and quacks-based perceptions and opinions. The trainees participated with eagerness and pledged to apply the acquired knowledge in their practices and desired to take benefit from further such trainings.

The outcomes of the training are expected to be further consolidated based on feedback of the beneficiaries and the trainers to make future trainings more effective.

SOME ACTIVITIES OF COMSATS' CENTRES OF EXCELLENCE

Researchers at TIB-China Identified Antibody Cocktail against Coronavirus

Scientists from the Tianjin Institute of Industrial Biotechnology (TIB), China, together with other Chinese R&D institutions, including Capital Medical University, Institute of Microbiology, and Beijing Institutes of Life Science have isolated two neutralizing antibodies—B38 and H4—that bind to the glycoprotein spike of the SARS-CoV-2 virus and thereby prevent the virus from entering host cells.

The two antibodies, isolated from recovered COVID-19 patients, can neutralize the virus in cell culture and target a shared epitope. Experiments already carried out on mice confirmed the antibodies can reduce the virus load in the lungs and can be mixed to contain the infection.

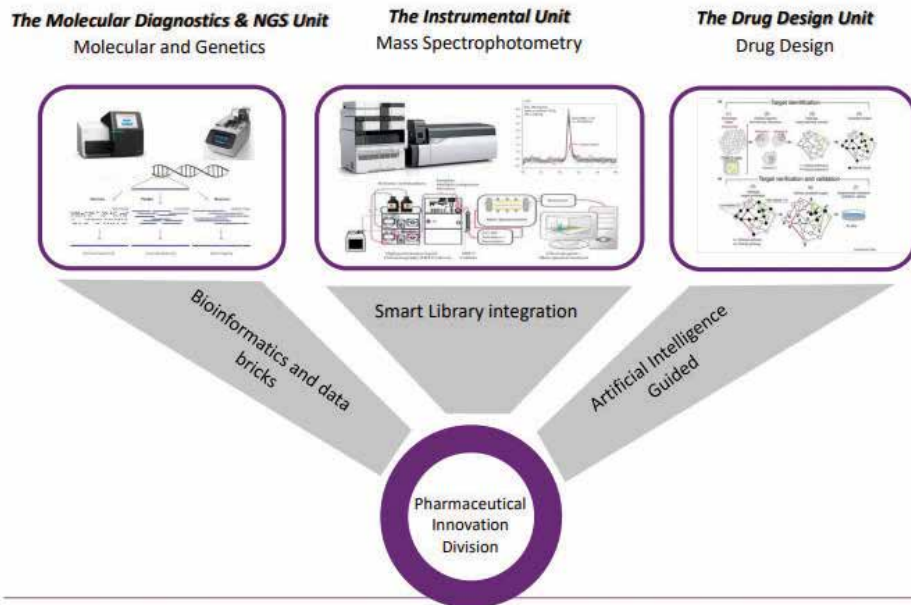
Their research suggests that the new information regarding the viral spike epitopes could aid the development of small molecule antivirals and vaccine candidates to fight the SARS-CoV-2 virus.

Pharmaceutical Innovation Division to be Established at RSS-Jordan

The Royal Scientific Society (RSS) of Jordan and IK Healthcare, Geneva, signed a Joint Venture (JV) on 24th June 2020, to establish the Pharmaceutical Innovation Division at RSS Biosafety and Biosecurity Centre.

This new Division will conduct collaborative preclinical and clinical research studies in the area of identification and testing of new disease indications for existing drug, medical devices, supplements and cosmetics candidates. It will serve as a platform

The Pharmaceutical Innovation Division-R&D



www.rss.jo



for research, drug development, clinical diagnosis, and treatment personalization.

RSS-Jordan to Cooperate with CNR-Italy for Project on Enhancing Energy Efficiency in Public Buildings

RSS, Jordan, has entered into an agreement with the Consiglio Nazionale delle Ricerche (CNR) of Italy to implement "BIM for Energy Efficiency in the Public sector (BEEP)" Project. The project under the Framework EU Funded Programme "ENI CBC Mediterranean Sea Basin Programme" aims at strengthening the use of Building Information Modeling (BIM) to enhance energy efficiency in public buildings.

The project will provide public administrations a powerful method for the energy rehabilitation of public buildings to be supported with private

funds through the Energy Performance Contracting. Project's outcome will be an innovative methodology based on the integration of emerging technologies tested on heritage public buildings.

Scientists at RSS-Jordan Produce Biodegradable Plastic

A team of researchers at RSS, Jordan, has conducted a research study detailing the optimized production of biodegradable plastic from renewable resources. The plastic synthesized by Dr. Diya Alsafadi, Dr. Othman Al-Mashaqbeh, and Eng. Ayah Mansour collectively was found to be stronger than petroleum-derived plastics making it more suitable for industrial application.

The research published in the journal MicrobiologyOpen (2020) can be accessed here: <https://doi.org/10.1002/mbo3.1055>

RSS-Jordan Conducts Training on Integrated Watershed Management

Four training workshops were conducted by RSS, Jordan, for the capacity-/building of construction workers regarding the building of rock gabions in the streams flowing into the Wala Dam of Jordan to prevent sediments flow into the Dam. In view of COVID-19 pandemic, the training was held with due precautionary and public safety measures.

The trainings were held within the scope of the project "Enhancing Livelihoods through Participatory and Integrated Watershed Management" implemented by the Action Against Hunger (ACF) in cooperation with RSS and funded by GIZ, Germany. The project aims at supporting local communities by adopting a "Cash for Work" approach to reduce the sediments accumulated in the Wala Dam.

The role of RSS in this project is to build the hydrological models, prepare the engineering designs, and train workers and build their capacities.

Researchers at ICCBS-Pakistan Identify Potential Anti-Viral Compounds against SARS-Cov-2

A team of young scientists at the Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) of the International Center for Chemical and Biological Sciences (ICCBS), Pakistan, has identified potential therapeutic compounds against the novel coronavirus (SARS-CoV-2).

Their study, published in the Journal of Biomolecular Structure and Dynamics, reports the details of extensive computational experiments that lead



to the identification of three FDA approved drugs namely Remdesivir, Saquinavir, and Darunavir as well as two natural compounds as potential drug candidates against COVID-19.

ICCBS-Pakistan Extends Scientific and Technical Services for Meeting Local Demands

Under the aegis of an MoU signed between ICCBS, Karachi, and Sindh Health Department, the HEJ Research Institute of Chemistry of ICCBS is providing technical support for the upgradation (Phase I) of Chemo Bacteriological Laboratory (CBL) of Sindh Health Department.

In the first phase, capacity building of staff for the CBL is being carried out by ICCBS, which is due to complete in few months, apart from purchase of basic equipment. After the completion of the laboratory's upgradation work, CBL would be able to carry out selected forensic chemical tests as per international standards.

On the other hand, to help meet the increased demand for coronavirus testing in Sindh Province of Pakistan, the Biosafety Level - III (BSL-III) laboratory housed at one of the research institutes of ICCBS has been transformed into a COVID-19 diagnostic center. This has

led to widened diagnostic capacity of Covid-19 infection in the province.

Head of ICCBS-Pakistan Appointed as COMSTECH Coordinator General

Prof. Dr. M. Iqbal Choudhary, Director of ICCBS, Pakistan, has been appointed as the Coordinator-General of COMSTECH (the Organisation of Islamic Cooperation's (OIC) Standing Committee on Scientific and Technological Cooperation) by Dr. Arif Alvi, President of Pakistan and Chairman COMSTECH. This would be in addition to his current responsibilities as Director ICCBS.

TÜBİTAK MAM Receives Zero Waste Certification

Due to efficient waste management activities carried out under the aegis of "Zero Waste" project, TÜBİTAK Marmara Research Centre (MAM), Turkey, has been awarded with a "Zero Waste Certificate" by the Turkish Ministry of Environment and Urban Planning.

Under the above-mentioned project, TÜBİTAK MAM has made significant improvements in the reduction of waste generation, use of environmentally



friendly products, waste sorting and recycling alongside increasing awareness of the employees on environment and zero-waste approach.

TÜBİTAK MAM Cooperates with Municipalities in Marmara

TÜBİTAK MAM, Turkey, is collaborating with the Union of Municipalities of the Marmara Region, and Kocaeli Metropolitan Municipality for the project on "Encouragement for the Production of Medicinal and Aromatic Plants".

The project will be initiated by Kocaeli Metropolitan Municipality in the Kandira Town of Kocaeli Province and aims to increase the income levels of villagers and farmers through various incentives. It shall make use of human and technical resources of the collaborating parties for the development and production of value-added industrial products in Kocaeli.

KazNU Enters the List of World's Top-200 Best HEIs

KazNU has secured 165th place by

moving up 42 positions in the QS global ranking. The university has thus successfully completed its objective of entering global Top-200 best HEIs by 2020.

Over the span of 9 years, the University has moved by almost 500 places and has successfully advanced in international rankings QS WUR, QS by Subject, ARES (Academic Ranking of World Universities-European Standard) and others, thus confirming its competitiveness in the global scientific and educational space.

In addition, ARES commended Al-Farabi Kazakh National University with an AA+ level, joining the ranks of leading European universities. The rating ranks Universities on indicators such as scientific and innovative activity, quality of teaching, level of digitalization, demand for graduates, international recognition, and academic mobility of students and teachers.

The positions of a university in international rankings and in the academic community are also taken into account.

Al-Farabi KazNU- Kazakhstan to Develop New Immunostimulators for Protection Against Coronavirus

A project of Al-Farabi Kazakh National University (KazNU), Kazakhstan, has won "Stop Coronavirus" Contest held by Science Fund JSC, Kazakhstan, to find effective solutions for addressing corona pandemic and its fallouts. The project aims to develop a technology for synthesizing new immunostimulators having antibacterial, antiviral, probiotic and antioxidant properties from *Spirulina platensis* cyanobacteria biomass and its various combinations with useful plants.

Plant preparation consisting of a potent antiretroviral, low-toxicity mixture of medicinal and edible plants will be synthesized under this project which is also expected to be published in high impact factor journals. Alongside, trainings will be provided to 2-3 qualified young researchers under this project.

CUI-Pakistan Wins Patent on Microfluidics

The United States Patents and Trademark Office (USPTO) has allowed a patent on microfluidics device to COMSATS University, Islamabad. This US-patent is an outcome of the PhD research of Dr. Madeeha Chaudry from Biosciences Department of CUI, Pakistan, that has led to a novel microfluidics device for real time drug monitoring of patients undergoing therapeutic interventions using very minute amount of blood serum samples on the principle of microchip assay. The device will enable therapeutic drug monitoring in terminally-ill patients or those undergoing treatment from sensitive drugs which require real-time monitoring to prevent over-dose.

Clearing the Haze Around Aerosol Assessments

By Xiaohong Liu, Zhaohui Lin*, and Minghua Zhang



*Prof. Lin Zhaohui
Director ICCES & Member COMSATS
Coordinating Council from China

If you have ever seen a reddish sunset through a haze of smog, dust, or smoke from a forest fire, you have witnessed the large effects that tiny aerosols can produce in the atmosphere. Scientists have learned a great deal about these diminutive particles in recent decades, but much remains to be revealed. In July 2019, about 100 scientists from 18 countries met in Beijing, China, to discuss recent advances in observing and measuring atmospheric aerosols and in our understanding of how aerosol particles interact with Earth's climate. The group also discussed how to improve computational models of atmospheric aerosols.

Atmospheric aerosols are liquid or solid particles between 1 nanometer and 10 micrometers in diameter that are suspended in the atmosphere. They may be produced directly in the form of mineral dust from deserts, sea salt from oceans, or black carbon and other particulates from fossil fuel and biomass burning. They may also be produced indirectly through chemical reactions between precursor gases emitted into the atmosphere. For example, power plants emit sulfur dioxide, which forms sulfate aerosols, and automobiles emit nitrogen oxides, which form nitrate aerosols.

In the atmosphere, where winds transport them laterally and vertically, aerosols participate in a myriad of complicated processes. They can act as cloud condensation nuclei, for example, or ice-nucleating particles that then serve as catalysts for cloud formation. Aerosols are eventually removed from the atmosphere when they attach themselves to Earth's surface (a process called dry deposition) or when rain or snow washes them out of the air (processes called in-cloud and below-cloud scavenging). However, aerosols are not passive particles; they actively affect the climate system and how we experience it. For example, they reduce visibility by scattering and absorbing sunlight, and they modify the ways in which clouds interact with light and other electromagnetic waves (radiative properties) by changing the number of droplets or crystals in a cloud, the amount of water clouds contain, cloud lifetime, and precipitation.

Persistent Uncertainties

In contrast to the warming effects of greenhouse gases (GHGs), aerosols are generally considered to cast a cooling effect on Earth's climate. Thus, aerosols have canceled or masked a significant fraction of Earth's warming (a positive radiative flux change) attributable to increased greenhouse gas concentrations in the atmosphere since the start of the Industrial Revolution in about 1750. Despite scientists' tremendous efforts to study aerosols and aerosol effects on climate, large uncertainties stubbornly persist in estimates of how much of the change in radiative flux has been caused by aerosols generated from human activities (i.e., anthropogenic aerosol radiative forcing).

Discrepancies in anthropogenic aerosol

radiative forcing estimates among the Earth system models (ESMs) in the Intergovernmental Panel on Climate Change's Fifth Assessment Report are responsible for the large spread of estimates—1.1 to 3.3 watts per square meter—of total anthropogenic radiative forcing (from GHGs plus aerosols) over the industrial era. This spread leads to large uncertainties in model simulations of present-day climate and projections of future climate. Therefore, there is a pressing need to reduce uncertainty in anthropogenic aerosol radiative forcing to improve the predictability of ESMs.

Working Toward a Solution

A sound approach to reduce the aerosol radiative forcing uncertainty in ESMs is to identify the key aerosol processes and properties responsible for the uncertainty and then to improve representations of these processes and properties in light of new observations. This approach was the goal of the 18th CTWF International Symposium on Aerosol and Climate Change last July, a forum (the "F" in CTWF) sponsored by the Chinese Academy of Sciences (C), The World Academy of Sciences (T), and the World Meteorological Organization (W).

Symposium participants discussed the roles of aerosols in the climate system, observations of aerosols from in situ and remote sensing platforms, and representations and modeling of aerosols in ESMs, and they examined key scientific questions and future research directions. We summarize those discussions here.

Aerosol-Cloud Interactions

Interactions between aerosols and clouds represent the largest source of uncertainty in estimates of aerosol

radiative forcing on climate. This large uncertainty has traditionally been attributed to poor simulations of the response of planetary boundary layer clouds (i.e., clouds in the lowest layer of the atmosphere) to aerosol perturbation. A recent observational analysis revealed that oceanic boundary layer clouds are even more sensitive to aerosol levels than previously reported. This finding suggests that aerosol effects might also be behind positive radiative forcing on other types of clouds (e.g., convective, mixed-phase, and cirrus clouds). Current ESMs represent these effects poorly in the case of mixed-phase and cirrus clouds, and they ignore them completely in the case of convective clouds.

For example, anthropogenic aerosol particles could suppress warm rains to allow more freezing of cloud water at subfreezing temperatures or increase condensation on more numerous cloud droplets in deep convective clouds. Either of these processes could cause larger releases of latent heat. This heat release could then intensify vertical motions in the clouds, producing larger anvil clouds with more radiative warming.

Ice-nucleating particles from naturally and anthropogenically emitted aerosols can induce warming effects by causing ice crystals to form rapidly and glaciating low-level mixed-phase clouds (i.e., clouds composed of both liquid droplets and ice crystals) or by promoting the formation of cirrus clouds. However, the mechanisms by which aerosols affect such ice-bearing, or “cold,” clouds and the resulting directions (positive or negative) and magnitudes of radiative forcing on climate are largely unknown. Integrated approaches that combine observations and modeling are needed to tackle key aerosol uncertainties in ESMs. Satellite observations could be combined with in situ observations of changes in clouds downwind of industrial pollution (e.g., clouds over the Northwest Pacific in the path of East Asian pollution outflows), in marine clouds influenced

by ship tracks, in stratocumulus clouds over the southeast Atlantic influenced by biomass burning smoke from South Africa, or in clouds influenced by volcanic plumes like those produced by Iceland’s Hólhauk eruption in 2014–2015. Comparing models with such observational analyses could help to identify shortcomings of model-simulated cloud responses to aerosols.

Aerosol Modeling and Representation in ESMs

High-resolution modeling will be vitally important for improving simulations of aerosol life cycles and aerosol-cloud interactions in ESMs. Coarse resolutions in ESMs (100–200 kilometers in horizontal dimensions) cannot represent fine-grained variability in cloud dynamics and thermodynamics in response to aerosol perturbations, which is an important factor contributing to the large uncertainty in aerosol-cloud interactions.

Numeric approximations, or parameterizations, used to represent turbulence are mainly responsible for underestimations of stratocumulus and cumulus clouds in the tropics and subtropics by coarse-resolution models, for example. Parameterizations of convection also lead to significant problems in simulating convective systems.

As the computational power and resources available to scientists increase, including the new generation of exascale computers that can perform a quintillion calculations per second, horizontal resolutions in next-generation ESMs are approaching 10–25 kilometers or even higher: ESMs with resolutions of about 3 kilometers now enable scientists to resolve convection phenomena. ESMs with increased resolutions are expected to have much better capability in realistically simulating the dynamics and thermodynamics of clouds as well as the three-dimensional distributions of aerosols in the atmosphere. As ESMs

achieve higher resolutions, the accuracy of turbulence and cloud microphysics parameterizations used in the models becomes increasingly critical. Thus, improvements and developments of model physics should continue to be emphasized in research efforts.

Aerosol Observations

Future observational programs should focus on the detailed multiphase chemistry of atmospheric aerosols and on routine measurements of aerosol profiles in the free troposphere (the part of the lower atmosphere that is not affected by Earth’s surface) and the upper troposphere. Such observations will help to improve understanding of aerosol processes and properties in the atmosphere, and the gained knowledge can be implemented into ESMs to improve their representation of aerosols.

Several specific topics that aerosol observational efforts can shed light on include the following:

1. The newly identified mechanisms of sulfate formation on the surfaces of preexisting aerosol particles (e.g., dust, black carbon) are one area to study. These aerosol productions have been found to contribute to rapid haze formation in heavily polluted regions (e.g., eastern China).
2. Secondary organic aerosols (SOA) and their roles in the formation and growth of new particles are also important. SOAs produced by forests and biomass burning, which represented the dominant source of sub-micrometer particles in preindustrial times, still contribute significantly to the formation and growth of new aerosol particles in both clean and polluted air.
3. Wildfires, which are becoming more frequent and intense in some regions (e.g., North America) with

climate change, exert important influences on radiation, clouds, and biogeochemistry in the Earth system through releases of GHGs and aerosols. However, wildfires and smoke aerosols are poorly represented and predicted in ESMs.

4. Aerosol processes at different levels in the atmosphere need to be studied further. Current field measurements mostly focus on aerosols in the boundary layer near Earth's surface, but more measurements of aerosols at upper levels are needed. Wildfires can inject smoke above the boundary layer, as can emissions from aircraft and volcanoes. Long-range transport of aerosols follows a high-altitude route. Aerosols at high levels can be entrained downward, providing an important source of aerosols in the boundary layer, especially in remote regions. And observations of free tropospheric aerosols—which can, for example, seed formation of cold clouds—could provide critical

constraints on how convective transport and aerosol scavenging are treated in models.

Coordinating Observations and Models

Coordinated efforts across different disciplines, agencies, and countries are needed to make the sort of rapid progress in aerosol and aerosol-climate studies that is critical for improving ESMs and future climate projection. Traditionally, aerosol measurements have not been used adequately to inform models.

An integrated approach is thus needed. Model developers should identify shortcomings in models and inform experimentalists of these issues. For example, modelers could identify weaknesses in current representations of aerosol parameters and processes or regions that have the largest model biases specifically related to aerosols. Experimentalists could then use this information to collect focused measurements for use in improving

model constraints.

A similar integrative approach could be used to tie together the different research communities studying clouds and aerosols. In situ aircraft measurements of clouds are encouraged to include aerosol measurements (e.g., of size distribution and chemical composition), thus making it possible to interpret aerosol-cloud interactions. Developing well-coordinated, international model intercomparison studies (e.g., Aerosol Comparisons between Observations and Models (AeroCom)) of aerosol and aerosol-cloud interactions that involve both experimentalists and modelers is a key step in greatly accelerating model developments that reduce the uncertainties of aerosols in ESMs.

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DYNAMICS OF COVID-19 IN THE ERA OF FOURTH INDUSTRIAL REVOLUTION

Amb (R) Fauzia Nasreen

During the current phase of history defined as the fourth industrial revolution, different assessments have been proffered about its impact on sustainable development. Concerns range from widening of gap and inequality within and among states to a more conducive environment for the developing countries. Adoption of 2030 Global Development Agenda with 17 Sustainable Development Goals (SDGs) is meant to address some of the dire inequalities in the spirit of international solidarity. The overarching ambition of these goals is to ensure that “no one is left behind” and make these interdependent goals inclusive especially in reaching out to “the furthest first”. The socio-economic aspects of the targets have been interwoven under such rubrics as eradication of poverty, hunger, good health, access to information and digital technology, combating climate change and food insecurity.

The novel corona virus has, without doubt, exposed in varying degrees the vulnerabilities of states and international system’s ability to manage shocks of the scale of the current pandemic. The outbreak of the contagious disease has multiple dimensions at the national, regional and global levels catapulting health and digital technological transformations as meaningful aspects of sustainable security. The health challenges have impacted rich and poor, developed and developing countries alike. However, the absorbing cushion and capacities of countries that are already confronting socio-economic fragility is extremely narrow compounding the systemic and structural issues. The situation in weak societies

where deprivation is endemic and employment and livelihood openings are severely constrained, the protective measures against the spread of the infectious disease becomes a colossal challenge. The curtailment of mobility and almost a halt in economic activity is a double whammy for the underprivileged and marginalized segments of society. Protection against the virus and making the two ends meet acquires a threatening dimension for these communities. The constricted fiscal space available to the governments aggravates the situation further.

The impact of COVID-19 is compelling states and societies to reorient their development plans in an effort to address imbalances in social sector allocations. Attention to the healthcare system and creation of corresponding infrastructure has perforce become a priority for the planners. The inadequacy of digitalization is additionally limiting new approaches to conducting businesses of daily lives. It is hampering online education, online businesses and most importantly telemedicine and telehealth. Adaptation to new approaches is constrained because of lack of broadband facilities and national telecommunication coverage. In a way the social stratification in terms of access to technology are complicating the already limited opportunities. At the same time, there is an increasing recognition that the core aspects of computer science, artificial intelligence, nanotechnology and data computation have been instrumental in managing the COVID-19 health and medicinal problems. The effective use of combination of the technologies available in the era of the fourth industrial

revolution has provided dividends for healthcare system and management. It is expected that these new tools will help in finding drugs and vaccine that would help in prevention and treatment of the virus.

A study jointly conducted by Centre for Infectious Disease Research and Policy, University of Minnesota and Harvard School of Public Health has dispelled “the idea that this is going to be done soon (as it) defies microbiology” (CNN report). The study has talked about three scenarios all pointing out that COVID-19 in one form or another will dog humanity for the next 18 months to two years. If the current situation is the new normal for the world population then what should be the long term response at the national, regional and global levels. These are times that demand international solidarity and united action against the pandemic. So what are the challenges and possible way out especially for Pakistan in overcoming the health hazards?

The Commission on Science and Technology for Sustainable Development in the South (COMSATS) has over the years smartly used its Internet Services (CIS) for providing telehealth services in remote and far flung areas of Pakistan. This is being done through the Basic Health Units (BHUs) where staff has been trained to manage the service linked to a team of doctors based in the CIS Technology Park in Islamabad. Necessary equipment is also providing the end users in BHUs. This has enabled in a modest way reaching out to the “furthest” communities in the country.

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About the Author: Ms. Fauzia Nasreen is a former diplomat with an extensive experience as a practitioner of diplomacy, researcher, trainer and manager. Her area of expertise is public policy, policy analysis, peace and conflict resolution and defence and strategic issues. Previously, she has served in various capacities in a number of missions. She has been ambassador to Nepal and Poland and High Commissioner for Australia. Ms. Nasreen has also been teaching as visiting faculty at prestigious higher education institutes of Pakistan. **Email:** fauzia.nasreen@comsats.org

Turkey Opens First Domestic Industrial Enzymes Factory

Turkey has launched its first domestic industrial enzymes factory with a view to utilize indigenous facilities for the synthesis of industrial enzymes used in the production of flour and fructose syrup (Hurriyet Daily News, 27th June 2020).

Speaking at the inauguration of the factory, Turkey's Industry and Technology Minister, H.E., Mr. Mustafa Varank, stated that the factory will help decrease Turkey's dependence on enzyme import. He added that in the next five years, Turkey will be able to meet 90% of its enzyme needs with the increase of national capacity in enzyme synthesis.

Palestine to Upgrade its Energy Sector with World Bank's Support

To help improve operational and financial performance of its energy sector, Palestine has received a \$14 million grant from the World Bank for its Advancing Sustainability in Performance, Infrastructure, and Reliability of Energy Sector (ASPIRE) Project (Smart Energy International,

6th May 2020). The project is a part of World Bank's Securing Energy for Development initiative and its successful completion will help Palestine diversify its energy sources. Phase one of the Project will focus on new infrastructure and modernization of existing distribution and transmission lines to enhance the reliability of the grid.

Egypt Partners with France for Reaching Targets of Sustainable Development Goals

Egypt has entered into an agreement with the French Development Agency (AFD) for the financing of its Energy Sector Budget Support Program (Egypt Independent, 16th June 2020). The agreement is part of Egypt's efforts to attain rapid financing packages from development partners to help counter negative impacts of the novel coronavirus.

Further, the Agreement aims to support the development of the electricity sector, in accordance with the goals set out in Egypt's Integrated Sustainable Energy Strategy 2035, adopted in October 2016. The strategy aims to enhance financial sustainability, improve management and operational efficiency

of the energy sector, and support the use of renewable energy.

The agreement would also help the country to achieve three of the 17 Sustainable Development Goals, namely providing clean energy at reasonable prices, attaining sustainable production and consumption, and entering into partnerships to achieve its goals.

AI Tech Aids China's COVID19 Fight

IriStar Technology Co., Ltd. of China has developed a facial recognition machine integrating infrared heat and iris recognition technology that can even recognize individuals wearing masks and goggles. The machine can also detect body temperature with high accuracy and efficiency (Xinhuanet, 28th June 2020).

With the widespread application of digital and Artificial Intelligence technologies, China has been able to fight COVID19 pandemic well. According to Chinese Ministry of Science and Technology, the country has also initiated two batches of key projects on new-generation AI technologies, with the investment worth US\$ 140.7 million.

Nine Renewable Energy Projects to be Launched in Kazakhstan

Kazakhstan has planned to launch nineteen renewable energy projects worth \$1.1 billion in line with its efforts to transition to low-carbon economy, diversify economy and energy supply, and bring private capital and investments into the country (The Astana Times, 19th May 2020).

Nine of these projects will be supported by Kazakh Invest, which is the main



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company responsible for overseeing country's investments.

Morocco Partners with Germany for Green Hydrogen Production

Morocco has signed a partnership agreement with Germany for the production of green hydrogen in the country and to set up research and investment projects on the use of eco-friendly energy source (Afrik21, 15th June 2020). The agreement will benefit Morocco's Green Plan, which has placed the Kingdom at the forefront in this domain in the African region. Under this Agreement, two projects have been announced; "Power-to-X" project proposed by the Moroccan Solar

Energy Agency (Masen) will help the production of green hydrogen and the establishment of a research platform for this energy source. The second project focuses on transfer of knowledge and the strengthening of skills in partnership with the Research Institute on Solar Energy and New Energies (IRESEN), Morocco.

Nanoparticle Technique for Rapid COVID-19 Test

Scientists from the University of Maryland School of Medicine (UMSOM) have developed an experimental diagnostic test for COVID-19 that can visually detect the presence of the virus in 10 minutes. It uses a simple assay containing plasmonic gold

nanoparticles to detect a color change when the virus is present. The test does not require the use of any advanced laboratory techniques, such as those commonly used to amplify DNA, for analysis. The research work has been published in the American Chemical Society's nanotechnology journal ACS Nano (Science Daily, 29th May 2020).

Once commercialize, this test could be far less expensive to produce and process than a standard COVID-19 lab test; it does not require laboratory equipment or trained personnel to run the test and analyze the results. If this new test meets FDA expectations, it could potentially be used in daycare centers, nursing homes, college campuses, and work places to monitor any resurgence of infections.

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Briefly challenges and suggestions for future planning are enumerated below:

Challenges:

- Balancing between safety measures and livelihoods
- Revamping the healthcare infrastructure
- Universal health cover that may include a combination of insurance cover for poorer communities and support for private welfare oriented initiatives as well government interventions (a kind of hybrid variant)
- Allocation of adequate resources to create smart healthcare infrastructure
- Bottom-up approach that would involve strategies developed through participation of localized structures
- Strengthening the role of BHUs in monitoring the local health conditions especially early warning about infectious diseases and disaster response. Integration of healthcare workers would provide the kind of outreach needed for early warning

- How to make ICT provide wide digital coverage to inaccessible and remote as well as rural areas.
- How can the marginalized communities get integrated in the response mechanisms.
- Given the lockdown situations, OPDs operating at minimum level how can telehealth/telemedicine fill the vacuum in reaching out to people without discrimination

Suggested Measures for Future Planning:

- The historical neglect of the healthcare system can be rectified through a well thought-out strategy and targeted policies.
- Allocation of more resources for health needs to be ensured. Spending should be smart to avoid wastage.
- COVID19 has shown how every individual in the humanity is interconnected. Infection contracted by one individual has implications for the entire world health. People oriented responses must be at the heart of public policies and

- strategies.
- R&D has been catapulted as a priority field improving chances for more regional and international cooperation to fight infectious diseases.
- Measures to upgrade ST&I as well as invigorated efforts are needed to achieve SDGs especially those related to health and wellbeing as well as alleviation of poverty. SDG 16 and 17 should form the basis of interventions at the local, regional and global levels. Removing inequalities within and among countries as the major objective as 16 and 17 have acquired more relevance and importance particularly in the context of post-COVID-19 environment.
- Smart collaboration at the regional and international levels can be strengthened diverting attention from conflicts meeting the collective challenges of peace and security. UN Secretary General's call for pause in global conflict is pertinent and worthy of global attention and response.

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- Hundred (100) scholarships for students/researchers for postgraduate studies at all campuses of COMSATS University Islamabad (CUI), Pakistan.
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- Five (05) post-doctoral fellowships at the International Center for Chemical and Biological Science (ICCBS), Pakistan.
- Five (05) post-doctoral fellowships at the National Research Centre (NRC), Egypt.
- Postgraduate Scholarships and Post-doctoral Fellowships at the International Centre for Climate and Environment Sciences (ICCES), and Tianjin Institute of Industrial Biotechnology (TIB), under PIFI Programme.
- Four (04) PhD scholarships at the Al-Farabi Kazakh National University (KazNU), Kazakhstan.

For further details on the scholarships, please visit www.comsats.org or write to tajammul@comsats.org and farhan@comsats.org.

Selected Forthcoming Scientific Events in COMSATS' Countries

- 01-02 Sept. 2020 International Academic Conference on Development in Science and Technology (IACDST), Dhaka, Bangladesh
(<http://www.academicworld.org/Conference2020/Bangladesh/1/IACDST/>)
- 18-19 Sept. 2020 International Conference on Nanomaterials and Biomaterials, Serrekunda, Gambia
(<http://eurasiaweb.com/Conference/11934/EUICNB/>)
- 01- 02 Oct. 2020 World Congress on Medical and Biological Engineering, Benin City, Nigeria
(<http://eurasiaweb.com/Conference/12466/EUWCMBE/>)

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Science Vision - Call for Papers on SDGs

COMSATS invites scholarly contributions for a special issue of its journal, Science Vision. The journal aims at highlighting the important scientific and technological developments having a bearing on socio-economic conditions of the people. For the special issue, we invite papers on topics related to UN 2030 Global Agenda – Sustainable Development Goals. For more information, please visit the journal's website: www.sciencevision.org.pk.

Call for Application 34th Khwarizmi International Award (KIA)

Iranian Research Organization for Science and Technology (IROST), and Iranian Ministry of Science, Research and Technology invites application from innovators, investors, scientists and researchers from across the globe for its 34th KIA. For more information and application, visit: ka.irost.org/en/k.



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