



COMSATS Newsletter

Commission on Science and Technology for Sustainable Development in the South (COMSATS)

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COMSATS Statutory functions and projects and programmes receive support from the Member States and Centres of Excellence (Ghana and Sri Lanka)

Meetings with Chairperson of COMSATS, H.E. Nana Akufo-Addo, President of Ghana, and senior officials of Ghana and Sri Lanka helped gathered due support for COMSATS operations.

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From the Executive Director's Desk

The world fully recognizes the potential that the South holds not only in its national resources but also in its human resource. China, Turkey, Japan, Korea, Singapore, Malaysia are some of the examples of a thundering success. Africa has remained struggling for progress and prosperity, but is now on a steady path of skillfully overcoming the societal challenges. It remained at the lowest in terms of progress in science and technology, education, social welfare, governance, and political stability and is now being considered 'continent of the future'.

Home to rich natural resources and biodiversity with sharpest of minds in its population, the continent is now attracting the world's attention with its huge untapped potential.

A delegation of COMSATS led by the Executive Director had the honour of meeting the Chairperson H.E. Mr. Nana Addo Dankwa Akufo-Addo. The hospitality at the Jubilee House, Accra, matched the President's grace and persona. I am thankful for the positivity and warmth shown by him and the renewed offer of support to COMSATS' operations

and functions. Ghana is being seen as a regional leader in Africa. Bestowed with remarkable natural beauty and resources, the country is the focus of attention of international IT enterprises. The economic growth in the recent years is also qualifying the country as a destination for foreign direct investment.

With growing socio-economic stability, the country is rising as a regional leader, a lot of which can be attributed to the country's current leadership.

A glimpse at the meetings held in Ghana and Sri Lanka constitute a prominent part of this Newsletter. Other activities and engagements during the period pertained to science diplomacy, mutual cooperation and tele-health are also highlighted. Meanwhile, our Centres of Excellence have remained active in their respective fields, a glimpse of which is given in the relevant sections.

With this first issue of year 2019, we look forward to receiving feedback and suggestions for improvement in future issues of this Newsletter.

HIGHLIGHTS FROM COMSATS SECRETARIAT

COMSATS' Officials meet the President of Ghana

A delegation led by the Executive Director COMSATS, Dr. S. M. Junaid Zaidi, visited the Republic of Ghana from 7th – 10th January 2019. The main aim of the visit was to seek guidance of the Honorable Nana Addo Dankwa Akufo-Addo (President of Ghana and incumbent Chairperson of COMSATS) for COMSATS' programmes in his capacity as Co-chair of Sustainable Development Goals (SDGs) Advocates.

The delegation led by Executive Director COMSATS, Dr. S. M. Junaid Zaidi, also comprised Prof. Dr. Ashraf Shaalan, Advisor to the President of National Research Centre (NRC), Egypt, and Chairperson of COMSATS Coordinating Council; Prof. Dr. Orkun Hasekioglu, Executive Vice President, Scientific and Technological Research Council of Turkey (TÜBİTAK), Turkey; Ambassador (R) Shahid Kamal, Advisor, COMSATS Secretariat; and Mr. Nisar Ahmad, Deputy Director (Systems), COMSATS Secretariat, Islamabad.

The meeting with His Excellency Nana Addo Dankwa Akufo-Addo was held on 8th January 2019 at Jubilee House, Accra. Also present during the meeting were Minister for Environment, Science, Technology and Innovation (MESTI), Ghana; Consulate General for Pakistan in Ghana; and high-level officials from President's office, Ministry of Foreign Affairs & Regional Integration – Ghana, and Council for Scientific and Industrial Research (CSIR) – Ghana.

To acquaint the Chairperson with COMSATS' recent activities, and projects and programmes, Dr. Zaidi made a presentation highlighting COMSATS' on-going programmes and future aspirations having a bearing on the socio-economic uplift of the developing countries. Appreciating His



Excellency's vision for Ghana's progress and development, Dr. Zaidi offered COMSATS' platform for initiating specific projects in Ghana in accordance with country's needs and priorities.

The President was briefed on COMSATS' Centre for Climate & Sustainability (CCCS), by Ambassador (R) Shahid Kamal. Mr. Kamal encouraged Ghana's participation in the initiative which currently has the representation of nine member states of COMSATS. Further discussions during the meeting touched upon:

- Prospects of enhancing COMSATS' membership especially to African countries;
- Possibility of setting-up COMSATS University, R&D centres and CCCS in Ghana; and
- Holding of fourth General Meeting of the Commission.

H.E. Akufo-Addo was appreciative of COMSATS' undertakings and achievements and reiterated his commitment towards strengthening scientific cooperation among developing countries. Dr. Zaidi expressed gratitude to H.E. Akufo-Addo for his recommendations and continued support towards COMSATS' mission.

Other important meetings during the

delegates' visit were with H.E. Prof. Dr. Kwabena Frimpong Boateng, Minister for Environment, Science, Technology and Innovation (MESTI), Ghana; Dr. Eugene Owusu, Special Advisor to the President of Ghana; Mr. Robert Kwame Nartey, Hon. Consulate General for Pakistan in Ghana; and Dr. Agyeman Victor, Director General of CSIR.

During the meeting with H.E. Prof. Dr. Kwabena Frimpong Boateng, discussions focused on Technology Bank established by TÜBİTAK and COMSATS' recent collaborations with United Nations agencies. The Honourable Minister acknowledged COMSATS' undertakings and pledged Ministry's support towards COMSATS' programmes.

The matters highlighted during the meeting with Dr. Eugene Owusu focused on interventions made by the Government of Ghana as well as COMSATS' endeavours for the realization of United Nations 2030 Global Agenda, apart from discussions on COMSATS' Centre for Climate & Sustainability (CCCS).

COMSATS' delegation also attended an interactive session at the Centre of Excellence in Ghana, Council for Scientific and Industrial Research (CSIR). During the session, a comprehensive



presentation was made by Director General CSIR about the functions and activities of the Institute and its umbrella R&D organizations.

The session was followed by a meeting with Dr. Agyeman Victor, Director General CSIR, at his office where the two sides discussed the following matters: Nomination of COMSATS Focal Person at CSIR; CSIR's participation in the forthcoming meeting of COMSATS Coordinating Council; and prospects of future collaboration

During the above-mentioned meetings, invitations were extended by Dr. Zaidi to the other side for visiting COMSATS Secretariat. The dignitaries were also presented with souvenirs and a set of COMSATS publications.

Relations Strengthened with COMSATS' Focal Point and Centre of Excellence in Sri Lanka

Dr. S. M. Junaid Zaidi, Executive Director COMSATS, along with Mr. Farhan Ansari, Sr. Assistant Director (Programmes), paid a visit to Sri Lanka from 24th to 26th February 2019. The purpose of the visit was to enhance bilateral scientific cooperation and

explore avenues for future cooperation in areas of mutual interest.

During the visit, meetings were held at Sri Lankan Ministry of Science, Technology and Research (MoSTR); Industrial Technology Institute (ITI), Sri Lanka; Pakistani High Commission in Colombo; and Sri Lanka Institute of Nanotechnology (SLINTEC).

The meeting with His Excellency Sujeewa Senasinghe, Federal Minister for MoSTR was held on 25th February 2019. Also present during the meeting were Mr. Chinthaka Lokuhetti and Ms. Himali Athaudage, Secretary and Director (International), respectively, of MoSTR. Chairman, Acting Director General, and Additional Director General (R&D) of Industrial Technology Institute (ITI), Sri Lanka, also attended the meeting. The Minister was appreciative of COMSATS programmes and expressed keen interest in establishing working relations with the Organization. Dr. Zaidi endorsed Minister's proposal for the establishment of Science and Technology University in Sri Lanka and affirmed COMSATS' support towards this project. Both sides also agreed to establish working groups for overseeing the matters related to student exchange and scholarships offered by Pakistani government to Sri Lankan students.

The meeting at MoSTR was followed by a meeting at ITI where possibilities were explored for increasing the participation of ITI in COMSATS scientific programmes. The meeting was held with Mr. Amal Dias, Chairman, ITI, in presence of senior officials of the Institute.

During the meeting, COMSATS' delegates were informed of ITI's collaborations with other COMSATS' Centres of Excellence.

Dr. Zaidi extended COMSATS' support for upgrading ITI's laboratories and facilitating the collaboration between the Institute and Welcome Laboratories, UK. A visit to research facilities of ITI presented to COMSATS' delegation the potential that the Institute offers for cooperation.

Also during the visit, a meeting was held with Pakistani High Commissioner in Colombo, H.E. Maj. Gen. (R) Shahid Hashmat. During the meeting, his support was sought for facilitating cooperation between COMSATS and Sri Lanka.

On 26th February 2019, Dr. Zaidi paid a visit to SLINTEC where he met with Mr. Harin de Silva Wijeyeratne, CEO and Dr. Vinitha Thandani, Research Scientist, SLINTEC. Possibilities were explored for initiating trilateral projects in medicine involving COMSATS, SLINTEC and ICCBS.

Meeting with Counsellor / Deputy Head of Mission of State of Kuwait in Islamabad

On 17th January 2019, the Executive Director COMSATS, Dr. S. M. Junaid Zaidi, held a meeting with Mr. Khalid Al-Yasin, Counsellor/Deputy Head of Mission of the State of Kuwait, in his office at Embassy of Kuwait in Islamabad, Pakistan. Dr. Zaidi was

accompanied by Ambassador (R) Ms. Fauzia Nasreen, Advisor at COMSATS Secretariat.

The main agenda of the meeting was to introduce the Deputy Head of Mission to the membership drive of COMSATS that resulted in addition of three countries, Turkey, Somalia and Yemen, in recent months. It was apprised that the membership campaign for the State of Kuwait was initiated in 1999. In this regard, former Executive Director COMSATS, Dr. I.E. Qureshi, had paid a visit to the country during which he also visited several leading Kuwaiti R&D/S&T institutions. Dr. Zaidi highlighted the benefits of joining COMSATS as a member country. The idea of Kuwait becoming COMSATS' Member State was given due importance by the Deputy Head of Mission and he pledged to follow-up the matter with relevant government authorities in Kuwait.

During the meeting, Mr. Khalid Al-Yasin was also briefed about the on-going and future projects of COMSATS. Kuwait's research/scientific institutions were invited to join as COMSATS Network.

Avenues of Cooperation explored with ADB's Country Office in Pakistan

On 29th January 2019, COMSATS' officials including Dr. Kamran Jahangir (Advisor TAC), Mr. Farhan Ansari (Senior Assistant Director, Programmes), and Ms. Rida Bokhari (Senior Programme Officer) held a meeting with Mr. Nasruminallah Mian, Senior Programme Officer at Asian Development Bank (ADB), Pakistan.

During the meeting, Mr. Mian received a briefing on COMSATS' national, regional and international programmes tailored to meet the socio-economic

needs of the developing countries. Mr. Mian was appreciative of COMSATS' mega-project i.e. the establishment of COMSATS Centre for Climate Change and Sustainability (CCCS) in its Member States. Further, he considered water-metering project of Centre for Climate Research and Development (CCRD), COMSATS University Islamabad (CUI), suitable for securing funding from ADB. He also suggested scaling-up COMSATS Tele-Health (CTH) project.

Both sides agreed to collaborate in climate change, agriculture, food security, risk management, energy, healthcare and education, and Information communication technology (ICT).

CTH-PIAAS hold Tele-health e-Trainings

During January and February 2019, a series of four online sessions on allergy & asthma was organized by COMSATS Tele-Health (CTH) and Pakistan Allergy, Asthma and Immunology Society (PAAIS) under the Memorandum of Understanding signed between the two organizations on 1st November 2018. The trainings were held through COMSATS Tele-Health (CTH) platform in order to create awareness among healthcare professionals associated with

CTH and its partner organizations about the diagnosis, treatment and handling complications relating to allergies.

The introductory session of the series was held on 17th January 2019, during which Dr Shahid, President of PAAIS, gave an overview of allergy and its causes, and outlined the contents of the proceeding sessions. The subsequent sessions held on 24th January and 31st January further delineated upon allergy mechanisms, best allergy treatments, and complications of allergy. During the last session, held on 28th February 2019, online allergy training was arranged demonstrating Skin Prick test and anaphylaxis treatment. Following the lectures, various queries regarding allergy and asthma from the participants were also addressed.

The sessions had virtual participation of a number of health professionals, including professors, doctors, paramedics and allied medical professionals. The participants joined in from COMSATS Tele-health- Basic Health Units at Gawadar, Swabi, Mansehra, Mardan, Quetta and Islamabad; Dr. Najma Ghaffar Hospital Tele-health Clinics at Quetta and Khal Magsi; and health centres of Human Development Foundation (HDF) at Rahim Yar Khan, Mardan, Tando Muhammad Khan and Zhob.



SOME ACTIVITIES OF COMSATS' CENTRES OF EXCELLENCE

KazNU-Kazakhstan Celebrates its 85th Anniversary

On 15th January 2019, Al-Farabi Kazakh National University (KazNU) celebrated 85th anniversary of academic excellence. The University established in 1934, has witnessed phenomenal growth over the years and continues to make an enormous contribution to the advancement of science and technology in Kazakhstan. KazNU, placed at no. 220 in QS World University ranking, is considered one of the world leaders in higher education.

On the other hand, Department of International Relations at KazNU celebrated its twenty-third (23rd) anniversary this year. The department provides training to highly qualified specialists in the field of international affairs and foreign policy, international law, and the world economy.

National Centre of Advance Medicine launched at KazNU-Kazakhstan

Al-Farabi Kazakh National University (KazNU), Kazakhstan, has launched the second phase of the development of Research and Educational Biomedical Cluster at KazNU in collaboration with the Severance Hospital, Yonsei University Health System, South Korea. The Almaty Clinical Hospital, transferred under KazNU management, shall be transformed into the National Center of Advanced Medicine in collaboration with a team of specialists from South Korea. The Centre will integrate medical education and science with practice and shall provide high-quality health services to the population in accordance with international standards.

KazNU in collaboration with Government of South Korea has already established a diagnostic center and a Higher School of Public Health

(Faculty of Medicine) for the training of undergraduate, graduate and doctoral students.

Al-Farabi Research and Educational Center Opens at Cairo University, Egypt

Al-Farabi Kazakh National University (KazNU), Kazakhstan, has opened Al-Farabi Research and Educational Center at Cairo University, Egypt, with the support of the Embassy of the Republic of Kazakhstan in Egypt. The inauguration of the Centre took place on the sidelines of an international scientific seminar "The Philosophical Heritage of Al-Farabi". H.E. Mr. Arman Isagaliyev, Ambassador of the Republic of Kazakhstan to Egypt, graced the ceremony with his presence.

Prof. Dr. Galym Mutanov, Rector of KazNU, while speaking at the occasion stated that Al-Farabi Research and Educational Center will serve as a good platform for studying and promoting the heritage of Al-Farabi along with nurturing common historical and cultural values of Egypt and Kazakhstan.

The Embassy of Kazakhstan in Egypt, taking the initiative has introduced at the Al-Farabi Center, a discipline for

the study of the Kazakh language for the first time in the curriculum of Cairo University.

ICCBS-Pakistan and TIB-China Join Hands for S&T Cooperation

The International Centre for Chemical and Biological Sciences (ICCBS), Pakistan, and Tianjin Institute of Industrial Biotechnology (TIB), China, have entered into an Agreement for the promotion of cooperation in various fields of bioorganic chemistry and biological sciences through R&D, staff exchange, transformation and industrialization of scientific and technological achievement.

The Memorandum of Understanding (MoU) was signed by Prof. Dr. Muhammad Iqbal Choudhary and Prof. Yanhe Ma, Directors of ICCBS and TIB, respectively, in a ceremony attended by Prof. Jibin Sun, Deputy Director, TIB; Dr. Atia-tul Wahabre, Associate Professor, ICCBS; and other officials from both sides.

Under the Agreement, both sides have agreed to establish China-Pakistan Joint Research Centre for Natural Products based on the structure of the National





Technology Innovation Centre for Synthetic Biology. Within the framework of this cooperation, ICCBS and TIB shall co-support the related S&T activities of COMSATS such as the International Thematic Research Group on Natural Products Sciences.

Vitamin A Enriched Varieties of Orange Maize Introduced by CSIR-Ghana

The Council for Scientific and Industrial Research (CSIR), Ghana, in partnership with the Crops Research Institute (CRI) has introduced new improved varieties of "Vitamin A" rich orange maize. The new varieties will enable the farmers to shift from the cultivation of white maize to the newly introduced orange and yellow maize that will help increase yield and income.

According to Dr. Manfred Ewool, maize breeder at CRI, orange maize matures early and vitamin "A" it contains is very essential for the eyes and skin. Further, when used as poultry feed, the laid eggs are more yellowish and healthier than those fed with the white maize. These varieties have already been introduced in the Central Region, Ashanti Region, Brong Ahafo Region and Amanase in the Eastern Region and they are extensively being promoted by CSIR

and CRI in communities of Ashanti and Brong-Ahafo regions with the support of the World Food Program (WFP).

CUI-Pakistan Signs First Patent Commercialization with Local Industry

COMSATS University Islamabad (CUI) has signed an Agreement with the Cotton Craft Pvt. Ltd. to commercialize a wound care application that promotes blood vessel growth thereby reducing the overall time for the wound to self-heal. This agreement is a step forward towards knowledge economy expected to benefit the society with sustainable industrial growth and innovative local products.

Dr. Muhammad Yar, Associate Professor, Interdisciplinary Research Centre in Biomedical Materials (IRCBM), CUI Lahore, is the principal researcher of the project that shall be undertaken at Lahore Campus of CUI.

CUI-Pakistan Strengthens Linkages with International Academic Institutions

H.E. Mr. Thomas Kolly, Ambassador of Switzerland to Pakistan along with a three-member delegation

from University of Geneva Medical School, Switzerland, and Gustave Roussy Cancer Center, France, visited COMSATS University Islamabad (CUI) on 8th February 2019. During the meeting, both sides expressed intent to strengthen academic and research cooperation in areas of mutual interest.

In order to discuss future avenues of cooperation and opportunities between CUI and Huanghuai University, China, a five-member delegation from the afore-said University visited Islamabad and Abbottabad campuses of CUI from 10th – 12th January 2019. In a similar vein, a delegation from Shenzhen University (SZU), China, led by its President Prof. Li Qianqian, paid a visit to COMSATS University Islamabad (CUI) on 22nd February 2019. During the visit, Document of Understanding was signed between the two sides for strengthening collaboration in academics.

Later, a two-member delegation comprising of Dr. Saudullah Ali, Registrar, and Mr. Hussain Shinan, System Administrator, Maldives National University, Maldives, visited CUI on 25th February 2019, with a view to interact with online team of CUI. The delegates expressed willingness to avail the offer of support extended by CUI.

CUI-Pakistan Hosted 5th CIMUN

COMSATS University Islamabad, Lahore campus, hosted 5th CIMUN Conference at Lahore Campus of the University from 31st January to 3rd February 2019, in collaboration with the United Nations Information Center (UNIC). The key theme of this year's CIMUN conference was related to Sustainable Development Goals.

The Conference had an attendance of international delegates from China, Nigeria and Afghanistan, along with national and provincial stakeholders.



Rector CUI participated as a Panelist in the 5th Annual Summit of Times Higher Education UK

Prof. Dr. Raheel Qamar, Rector CUI, was invited by the Association of Commonwealth Universities, Times Higher Education and Qatar University, to participate as a speaker in a panel discussion at the Emerging Economies Summit on "SDGs and Role of Universities". Speaking at the Summit, Dr. Qamar stressed the role of governments for involving universities in policy making on gender equality, industrial growth and innovation. Further, he stated that a renewed focus on societal impact and job creation through technology adoption is the need of the day.

RSS-Jordan Launches MRV System for Greenhouse Gas Emissions and Mitigation of Climate Change

The Royal Scientific Society, Jordan, under the patronage of HRH Princess Sumaya Bint El Hassan, has successfully launched the Multi-Level Integrated Monitoring, Reporting and Verification (MRV) system on 5th February 2019.

The System, first of its kind in the Arab region, has been developed with the support of the World Bank for the Jordanian Ministry of Environment.

The integrated MRV system will contribute to the measurement of the Greenhouse Gas (GHG) emissions and emission reductions at the national, sectoral, ministry and project/program levels. Moreover, it will facilitate verification of the data and multiple standard reports through a centralized database. The system will also support the establishment of future market-based instruments and assessment of progress towards Jordan's commitments under the Paris Agreement. Initially, the MRV system will enable climate change mitigation interventions in Jordan through piloting Energy Information from all sectors (Renewable Energy and Energy Efficiency), and will soon be expanded to all relevant sectors in Jordan including industrial, transport, waste, and agriculture.

The key stakeholders of the MRV system are: the Ministry of Energy and Mineral Resources; Ministry of Water and Irrigation; Ministry of Municipal Affairs; Ministry of Information and Communication Technology; Ministry of Planning and International Cooperation; Ministry of Public Works and Housing; Greater Amman Municipality; Jordan

Renewable Energy & Energy Efficiency Fund; and Department of Statistics.

Human Genome Sequencing Launched at BCSIR-Bangladesh

The genomics laboratory of Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh, has initiated whole genome sequencing of humans for the identification of genetic diseases. First in Bangladesh, the programme was inaugurated by His Excellency Mr. Yafesh Osman, Ministry for Science and Technology, Bangladesh, and would be run by highly-trained scientists and is expected to reduce the cost along with saving valuable gene information.

To serve the purpose, latest NovaSeq machine has been installed at BCSIR which has the capability of sequencing genomes of 48 people in 72 hours. A reference microchip will be created by matching the genetic markers found in Bangladesh with the ones found in foreign countries hence leading to cheap and easy identification of diseases. According to Dr. Md. Salim Khan, Project Director and Principal Scientific Officer at BCSIR, initially a data base of cancer patients will be developed by sequencing the genome of 20 breast cancer patients.

SPECIAL ECONOMIC ZONES: SOCIO-ECONOMIC IMPACT ON PAKISTAN

by Fauzia Nasreen

Special Economic Zones and such variations as industrial zones, industrial and technological parks have a direct bearing on economic growth as they attempt to attract foreign capital, improve exports and enable connection with the global supply and value chains. They strengthen public and private sector capacities to harness and institute people-oriented development strategies and build sound framework for economic benefits. The indirect spin-off effect is in terms of enhancement of social sector, growth and development in general and human resource development in particular. Both the direct and indirect benefits of SEZs contribute towards effective poverty reduction strategies and policies. Stable macroeconomic conditions provide the necessary space for building resilient communities equipped with the tools to meet the challenges of the ever changing environment.

There is an inextricable link between economy and poverty reduction. Therefore, in order to break the vicious cycle of poverty, SEZs could provide an important intervention mechanism. In the context of Pakistan, the causes of poverty have generally been associated with governance issues and slow economic growth. Despite various measures, development spending has not only been erratic but has not really resulted in the desired outcomes. Inequality and regional disparities have had a crippling effect on poverty levels and economic resilience. From the perspective of SEZs and socio-economic impact four aspects are important: employment generation; skill formation (human capital development) and

technology; knowledge up-gradation; and economic rejuvenation. SEZs smart management would translate into the achievement of the twin goals of economic prosperity and resistant communities.

Pakistan has faced several challenges in the past few decades that have had adverse impact on its development. The Human Development Index (HDI) and Human Capability Index (HCI) indicators reveal that Pakistan has not sufficiently invested in its people. Notwithstanding the constraints, there have been periods where poverty levels had gone down. The two severely neglected areas identified have been healthcare and education both determine the quality of human resource. In addition, the challenges related to insecurity, struggle against radicalization, fight against terrorism and the economic conditions place the authorities in Pakistan in a greater dilemma in determining its priorities for resource allocations.

The afore-mentioned situation assumes even more criticality given the youth bulge presently confronted by Pakistan. This factor presents both challenges and opportunities which can be favourably linked to the establishment of SEZs in Pakistan. According to the UNDP National Human Development Report of 2017, Pakistan needs to generate 1.3 million jobs every year. Accelerated employment growth is necessary for harnessing the youth bulge for human and material dividends. Targeted strategies for nurturing the requisite skills, knowledge and expertise are a must for Pakistan to fully benefit from the opportunities coming its way in the

form of FDIs, SEZs, CPEC and other openings.

Pakistan's regional situation has been in a flux primarily due to tensions between India and Pakistan and instability in Afghanistan. With its vast potential in terms of human resource and markets, South Asia must become a vibrant region where collective capacities can be channeled for overcoming the debilitating impacts of such threats as climate change, disease and hunger, depleting water resources and human security. These threats do not know boundary and will, therefore, retard development in the overall regional context. In the Asian region, ASEAN can be cited as an example of successful regionalism where SEZs have been effectively used to accelerate economic growth and development. Varied strategies have been adopted depending on the priorities in terms of locally oriented preferences. SMEs, exports and service sector have been accorded precedence. The fact that they have become part of the global value chains re-emphasizes the rationale for setting up SEZs and their relevance for development. In this context, CPEC presents enormous opportunities where well thought-out SEZs strategies and policies could promote integration of West Asia and Central Asia and, subsequently, as situation normalizes prospects for the eastern side will add to the socio-economic vibrancy of the region.

Globalization and information technology has had profound impact affecting every region in multiple ways. While it has helped in developing

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connectivity and created a virtual world, e-commerce and entrepreneurship patterns have become the defining characteristics of global, regional and national transactions. The ensuing challenges and opportunities have created an environment that brings with it vast possibilities together with management problems. Correspondingly, protectionist trends have made the conditions for economic progress and trade much more corrosive. Initiatives for reaping the advantages of globalization require astute planning.

The world is also in the midst of the fourth industrial revolution and the frontier technologies and knowledge are transforming all aspects of our private and public lives. Artificial intelligence, big data and digital revolution have introduced new dynamics and industries as well as human resource development will have to be adapted accordingly. Therefore, planning and implementation of SEZs require in-depth assessment of all these interlinked factors. For example, what level and type of activity will be envisaged for each of the nine Zones planned under CPEC. Labour intensive versus high technology activity would require semi-skilled to skilled labour in the first instance and well qualified and smart manpower in the second instance.

The international development paradigm has also undergone dramatic change especially since the start of the new millennium. The focus on poverty and the interlinked issues of hunger, disease, and economic deprivation was subsumed by the all encompassing Cold War situation. However, in the last several decades, poverty eradication and the ancillary challenge of sustainability have emerged as a global priority. At the Millennium Summit in 2000, the international community realized that the kind of threats to international peace and security

demanded a comprehensive approach premised on human security and in line with the Human Development parameters rather than purely GDP based economic progress.

The United Nations High Level Panel of Eminent Persons was tasked to identify the challenges and assess the contours of collective response to the changed environment. Their report titled Threats, Challenges and Change of 2004 served as a backdrop to the Millennium Development Goals (2010-2015) and have now evolved as the Sustainable Development Goals. Amongst the eight MDGs, Goal 1 was about eradicating poverty and hunger. Goal 1 and Goal 2 of SDGs are about eradicating poverty and ending hunger. However, all the goals are interlinked with cross cutting measures and interventions with the underlying objective of socio-economic impact to end inequality and of 'leaving no one behind'. Pakistan has adopted the SDGs at all levels. It would be important to see to what extent the SEZs would help in improving the socio-economic output in the areas surrounding the SEZs and to what extent they would help in implementing the SDGs. The Belt and Road Initiative (BRI) project of China connects three continents and a wide range of countries with diverse resources both human and material. CPEC being its flagship venture can be and is being leveraged to enhance the prospects associated with SEZs especially in Pakistan. The interests generated widely at the regional and international levels have greatly enhanced the prospects for FDI. If managed efficiently and effectively, it can play a crucial role in addressing the issues related to poverty in Pakistan.

Highlights

1. Pakistan enjoys wide diversity in terms of geography, climatic

conditions, resources, culture and level of development. These are significant factors and have a bearing on the selection of the locality for SEZs from the point of view of poverty alleviation. While there are important lessons to be learnt from the SEZs experience elsewhere, local environment will have to be kept in mind in order to achieve the socioeconomic dividends.

2. The political system and governance structures also have an important role in creating the right conditions for distribution of the benefits of SEZs down to the grassroots level. Federal, provincial and local governance structures will need to work in tandem for policy cohesion.
3. Mapping of regional strengths and weaknesses is an arduous task but is crucial for targeted policy interventions and efficient functioning of the SEZs. Reports of UNDP, ADB, World Bank and others can be helpful in this regard. Reliable data availability and its accurate interpretation on the basis of indicators based on indigenous parameters will help prevent defective and distorted assumptions.

Way Forward

Human Resource Development: In order to fully benefit from the SEZs, there is a dire need for smart planning for the human resource development, which has to be compatible with economic and industrial development. Additionally, it should factor in sectors that would qualify for development of various SEZs. Since the declared SEZs are in such areas as agriculture, food/fruit

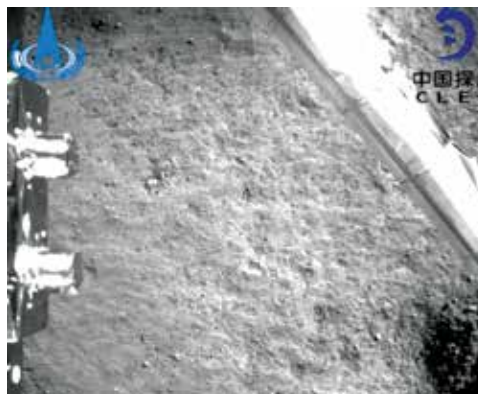
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S&T AND DEVELOPMENT NEWS FROM MEMBER STATES

China Makes Historic Landing on the Dark Side of Moon

On 3rd January 2019, a Chinese robotic spacecraft – Chang’e 4 – landed in the South Pole-Aitken Basin area of the moon, also known as the “far side” or “dark side”. The probe was launched from Xichang Satellite Launch Centre in China on 7th December 2018 and it arrived in lunar orbit on 12th December 2018.

Chang’e 4 is the first ever spacecraft that landed successfully on this unexplored area of the moon which is never visible from the Earth. The probe is expected to analyse the unexplored region’s geology and investigate Von Kármán crater, located within the South Pole-Aitken (SPA) Basin. Furthermore, the spacecraft carried six live species from Earth, including cotton, potato, yeast, rapeseed and Arabidopsis



China National Space Administration /Xinhua News Agency/Jin Liwang/Getty Images

(flowering plant). Among these, only cotton plant sprouted on the moon after the probe started watering the seeds and channeling natural light from the Moon’s surface to them upon receiving instructions from ground control. However, the cotton plants exhibited stunted growth compared to the earthbound control plants and according to Xinhua news agency the

plants did not survive the long lunar night which started on January 13 and lasted for two Earth weeks (Xinhuanet, 3rd January 2019).

Kazakhstan Constructs Wind Farms for Electricity Production

Kazakhstan is constructing its largest wind farm in its Aktobe region (Kazakh-TV, 9th January 2019). The farm, to be established with the support of an Italian corporation, is consistent with the concept of Kazakhstan’s transition to green economy model and to generate half of its energy through alternative energy sources by 2050. Once operational, the farm will generate 48 megawatts (MW) electricity through thirteen (13) turbines that will be installed in Kargaly district and will provide the region 198 kilowatts (KW) of electricity per hour.

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processing, mineral resources, manufacturing, information technology, textiles etc., different levels and types of skills would be needed for which requisite education and training programmes should be executed.

Capacity-Building and Training: Since the nature of economic activity will be continuously evolving, regular plans for capacity building should be developed and included in workforce management. Vocational training programmes should be variegated in accordance with the requirements of the industrial activity. As part of the poverty reduction objective, enhancement of local capacities for improved job opportunities must be prioritized.

Integration of SMEs and Creation of Clusters: Over 90 percent of economic

activity in Pakistan is performed by the Small and Medium Enterprises. They are a source of great strength for the business and commercial output. Their linkage or integration within the SEZs could play a significant role. There would be a need to ensure that the local industry is not hit too hard by the SEZs. In order to make the SEZs more effective and meaningful for socio-economic impact, clusters built around locality’s skills and strengths would make it possible for the fruits of SEZs to be enjoyed at a broader scale.

Role of the Educational Institutions: The 2017 UNDP report on Human Development and Youth identifies three Es in the context of the youth bulge and their integration. It points towards three drivers: Education (quality), Employment (equitable opportunities) and Engagement. The report provides a wide range of measures in which educational institutions of Pakistan have

a vital role. SEZs must factor in how their activities can provide impetus to the three Es.

Social Safety Net and Healthcare: In addition to the welfare of the individuals and families associated with the SEZs, improvement in the healthcare and quality of life of the people in the surrounding communities would go a long way in supporting the objectives outlined above and in reducing poverty in these communities. SEZs, under CPEC, could take advantage of the recent development and poverty alleviation discussions between China and Pakistan. Better food intake and clean and safe drinking water together with good hygiene facilities and disaster preparedness strategies if linked with SEZs would be beneficial for the investors in the SEZs and for the communities.

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Rapid Test to Detect Antimicrobial Resistance in Real Time

A highly sensitive rapid genetic test has been developed by researchers at American University that can detect resistance in bacteria to two common antibiotics, i.e., erythromycin and azithromycin (*Science Daily*, 28th February 2019). The two antibiotics are commonly used for the treatment of strep throat and other respiratory illnesses.

This genetic test can give results in 10 minutes in contrast to conventional culture-based methods which are not only time-consuming but also expensive. It also offers a way to monitor the prevalence of antimicrobial drug resistance.

Once approved from US Food and Drug Administration (FDA), the test can improve point-of-care diagnostics without prescribing inappropriate antibiotics hence leading to better outcomes.

AI to Assist People with Speech Disabilities

A team of neuroengineers at the Zuckerman Institute of Columbia University, New York, United States, have created a system that harnesses the power of speech synthesizers and artificial intelligence to translate thoughts into recognizable speech.

In their study, the team led by Dr. Nima Mesgarani trained a computer algorithm (vocoder/speech synthesizer) to interpret the brain signals of epilepsy patients listening to sentences spoken by different people (*LabRoots*, 31st January 2019).

The sounds produced by the vocoder in



Reference: <https://www.americanewshour.com/tech-science/ai-can-now-translate-your-brain-activity-into-speech/721/>

response to those signals were analyzed by neural networks (a type of artificial intelligence system that mimics the structure of neurons in the biological brain) thereby producing robotic-sounding voice. This research has laid the groundwork for helping people who cannot speak such as people with amyotrophic lateral sclerosis (ALS) or those recovering from stroke.

Scientists Found Sustainable Solution to Remove CO₂ from the Air

Scientists from RMIT University, Melbourne, Australia, have developed a new technique that can efficiently convert carbon dioxide (CO₂) gas back into solid particles of carbon. The research published in *Nature Communications* offers an alternative pathway for safely and permanently removing the greenhouse gas (CO₂) from our atmosphere (*Nature Communications*, 26th February 2019).

Current technologies for capturing and storing CO₂ focus on compressing the gas into liquid form and ultimately injecting it underground. However, successful implementation of such technologies is limited by engineering challenges, economic viability issues and environmental concerns about

possible leakage from the storage sites.

On the other hand, conversion of CO₂ directly into solid form requires an extremely high temperature which is industrially unviable. In contrast, through this technique CO₂ can be sustainably removed from the environment through harnessing liquid metals as catalyst at room temperature.

Wi-Fi Signals to Power Electronics

MIT researchers have developed a flexible device that can convert energy from Wi-Fi signals into electricity (*Nature*, 29th January 2019). The fabricated device takes advantage of a flexible battery-free "rectenna" that can capture wavelengths, including those associated with Wi-Fi signals, and convert them to AC current.

A "two-dimensional" semiconductor (made of molybdenum disulfide – MoS₂), then rectifies AC current to DC creating the voltage that could be used to power wearable, sensors, medical devices, or large-area electronics.

In contrast to batteries, this system has much longer life cycle as the electrical devices would charge themselves with ambient radiation. Besides, unlike batteries, there would be no need to dispose of the components.

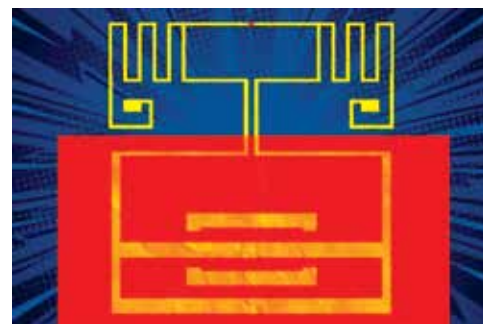


Photo Credit: Christine Daniloff

Scholarships offered by COMSATS' Centres of Excellence for Member States

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- Postgraduate Scholarships and Post-doctoral Fellowships at International Centre for Climate and Environment Sciences (ICCES), China, and PFIIF programme.
- One (01) post-doctoral fellowship at Bangladesh Council for Scientific and Industrial Research (BCSIR), Bangladesh.

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

- 3-5 May 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT-2019) East West University, Dhaka, Bangladesh
(<https://icasert.com/>)
- 11-14 June 2019 Better Process Control School Industrial Technology Institute (ITI), Malabe, Sri Lanka
(<http://iti.lk/>)
- 16-20 June 2019 8th Biennial Jamaica Diaspora Conference. Theme: Jamaica and the Diaspora: Building Pathways for Sustainable Development, Kingston, Jamaica
(<https://www.moh.gov.jm>)

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Honourable mentions: Mr. Tila Mohammad, Mr. Kehinde Musodiq Sanni, Mr. Anya Augustine Igwebuikwe and Mr. Prem Thapamagar



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