



COMSATS Newsletter

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

November - December 2017

6
2017

Vol.9

www.comsats.org



ED COMSATS, Dr. S.M. Junaid Zaidi, and Somali Minister for Education Ministry of Education, Culture, and Higher Education, H.E. Abdi Dahir Osman, signing the Membership Agreement (9th November 2017)

Inside this Issue

From the Executive Director's Desk	01
News/Activities/Highlights from COMSATS Secretariat	02
Special Section: The Federal Republic of Somalia Joins COMSATS as its 26 th Member State	09
Member Country in Spectrum: Somalia	11
Activities/News of COMSATS' Centres of Excellence	13
Opinion: Internet of Things, Cloud and Fog Paradigm: The catch-up	20
Science, Technology and Development	22
Profile of Member COMSATS' Technical Advisory Committee: Prof. Dr. Yin Li, Institute of Microbiology, CAS, China	23
COMSATS' Brief and Announcements	24

Patron:

Dr. S.M. Junaid Zaidi
Executive Director COMSATS

Editors:

Ms. Farhana Saleem
Ms. Sameen Ruqia Imadi

Designing & Development:

Mr. Imran Chaudhry

Contributions from readers are welcome on any matter relevant to the mission of COMSATS, namely the promotion of South-South cooperation in science and technology for sustainable progress of the developing countries. The responsibility for the accuracy of any information rests with the original source. Views expressed in this publication do not necessarily reflect those of its editors, publisher or COMSATS.

COMSATS Secretariat:

Shahrah-e-Jamhuriat, G-5/2
Islamabad - Pakistan
Tel: (+92-51) 9214515 to 17
Fax: (+92-51) 9216539
E-mail: comsats@comsats.org
URL: www.comsats.org

From the Executive Director's Desk

The industrial and S&T revolutions that humanity witnessed during the last hundred years or so has shaped and modernized this world in many ways. The level of socio-economic benefits that nations have reaped from these revolutions is visible from their development indicators. International organizations, like COMSATS, are working to bridge the development gap between the North and the South for a more equitable world, as well as create collaborations between the two regions based on mutual interests and to create a more peaceful world.

Conscious of its responsibilities towards its mission and the stakeholders, COMSATS is on a constant mission to re-align itself to meet the needs of its mission and objectives. A recent activity in this connection has been the 2nd meeting of its think tank, the Technical Advisory Committee, held in Italy, hosted generously by The World Academy of Sciences (TWAS) (page 02). A panel of international experts comprising the Committee sat together and advised COMSATS Secretariat on means to enhance research collaborations and technology-transfer for achieving the objectives of COMSATS' Network.

Another prominent report that this newsletter

covers is of the World Science Forum 2017 (page 13). Attending the WSF-2017 was a matter of pride for me for two reasons: i) It was coordinated by COMSATS' Centre of Excellence in Jordan, Royal Scientific Society; ii) Advocacy of science at the highest level is the premise on which COMSATS was built and any such initiative is heartening.

COMSATS Secretariat, while focusing on its mandate of increasing the involvement of North for the betterment and development of South, and increasing the outreach of the organization, kept its efforts going as the officials held meetings with foreign diplomats from Azerbaijan, Argentina, Nepal, Morocco, and Australia. Moreover the officials from the Secretariat visited countries including Oman, China, and Italy to enhance the cooperation with the institutions there (page 6).

As you go through the pages of this issue of COMSATS Newsletter, 2018 has already dawned on us. A resolution at COMSATS would be towards its mission of expansion in terms of membership, programmes and collaborations. With a wish of peaceful and prosperous future, I invite the readers to feel free with any feedback to improve COMSATS' activities and impact.

NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

Second Meeting of COMSATS Technical Advisory Committee Held in Trieste, Italy

COMSATS held the second meeting of its International Technical Advisory Committee on 15th November 2017, hosted by The World Academy of Sciences (TWAS) in the scenic city of Trieste, Italy.

The Committee Members met to give their technical inputs for future direction and programmes of COMSATS. The TAC members that attended the meeting were Dr. Sabah AIMomin, Kuwait; Prof. Huadong Guo, China; Dr. Jalila Ben Salah Abbes, Tunisia; Prof. Dr. Yin Li, China; Prof. Sahalu B. Junaidu, Nigeria; and Prof. Dr. Amal Al-Aboudi, Jordan; while the following two members joined through video-conference: Dr. Richard Catlow, United Kingdom; and Prof. Dr. Sok Ching Cheong, Malaysia. The meeting was also attended by the Executive Directors, of COMSATS and TWAS, and Heads of COMSATS' Centres of Excellence in Egypt and Turkey. The representatives from other International organizations based in Italy, i.e., the International Centre for Theoretical Physics (ICTP) and the International Centre for Genetic Engineering and Biotechnology (ICGEB) also observed the deliberations of the meeting.

During the discussions, the Technical Advisory Committee members were pleased to note the increasing membership of organization, with Federal Republic of Somalia and Republic of Turkey being the latest to join. They encouraged COMSATS Secretariat to facilitate the expansion of the Network to the South and the North, and up-gradation of existing Centres of Excellence through financial and technical support from international donor and development organizations.

The TAC members encouraged COMSATS to initiate

new programmes and projects, which are significant for achieving the Sustainable Development Goals (SDGs). The Centres of Excellence were urged to prepare joint research proposals for possible funding by international donor and development agencies. In view of the emerging trends in global partnerships, COMSATS was advised to facilitate the Triangular (South-North-South) Cooperation in science and technology.

It was decided that the 3rd meeting of COMSATS Technical Advisory Committee is planned to be held in conjunction with the 21st meeting of COMSATS Coordinating Council in Almaty, Kazakhstan, in April 2018.

Cooperation Agreements Reached with International Organizations

Memorandum of Understanding with UNESCAP

On invitation by the Executive Director COMSATS, Dr. S. M. Junaid Zaidi, UN Under-Secretary General and Executive Secretary of UN Economic and Social Commission for Asia and the Pacific (UNESCAP), Dr. Shamshad Akhtar, visited COMSATS Secretariat on 20th December 2017. She was accompanied by Mr. Jonathan Wong, Chief Technology and Innovation, Trade, Investment and Innovation Division, and Mr. Michael Williamson, Head, South and South-West Asia Office.

The Executive Secretary, UNESCAP and Executive Director COMSATS agreed to forge collaborations for facilitation in establishing institutions like COMSATS' flagship project 'COMSATS Institute of Information Technology' in other member countries of COMSATS; setting up of climate change research institute in one of the member states of COMSATS; and cooperation between COMSATS and UNESCAP and other UN agencies. UNESCAP offered to



A session of the 2nd Meeting of Technical Advisory Committee at TWAS, Trieste, Italy



Executive Secretary UNESCAP and Executive Director COMSATS signing the MoU

help COMSATS in promoting policy dialogue on science, technology and innovation in the member countries with the involvement of respective governments.

The pledge of collaboration between the two Commissions was further cemented by the signing of a Memorandum of Understanding between COMSATS and ESCAP on 20th December 2017. The agreement, which aims to promote science, technology and innovation (STI) as key means of implementation to meet the ambitions of the Sustainable Development Goals (SDGs), was signed among a gathering of foreign diplomats and representatives of various government officials of Pakistan during a graceful ceremony in Islamabad. The Executive Director COMSATS and the Executive Secretary UNESCAP signed the agreement on behalf of their Commissions. The Minister for Science and Technology, Government of Pakistan, H.E. Mr. Rana Tanveer Hussain, and the Federal Secretary of the Ministry, Ms. Yasmeen Masood, also graced the ceremony with their presence.

Protocol of Cooperation with Oman National Computer Emergency Readiness Team (OCERT), Oman

A "Protocol of Cooperation" was signed between COMSATS and The Oman National Computer Emergency Readiness Team (OCERT) to cooperate in the areas of cyber security and computer emergency response program on 2nd November 2017 at OCERT, Oman. The Executive Director COMSATS and Eng. Badar Al Salehi, Director General OCERT, signed the protocol on behalf of their organizations during a ceremony held at OCERT building. The signing ceremony was also witnessed by visiting delegate and senior officials of OCERT.

The purpose of this PoC is to seek research and development cooperation in the areas of cyber security



MoU being signed by the Director General OCERT and Executive Director COMSATS

and computer emergency response programme between the two parties. The cooperation would also cover other activities, such as trainings and workshops, conferences and bilateral visits. This PoC also provides a framework for the enhancement of research and capacity building activities in both organizations. According to the Protocol, both parties agree to jointly work, inter alia, on the following collaborative activities:

- Conducting joint research and development projects;
- Exchange of information and technical expertise; and
- Search for opportunities to collaborate in the future.

Meetings with Representatives of Foreign Missions in Islamabad

During November-December 2017, representatives from foreign missions in Islamabad belonging to Argentina, Australia, Azerbaijan, Morocco, and Nepal visited COMSATS Secretariat in Islamabad. The officials were informed about the scope, mission and mandate of the organization. The Ambassadors of non-member countries were also informed about the benefits and obligations of joining COMSATS as member state. One of the common agenda items of the meetings was to convince the Ambassadors of non-Member States to join COMSATS as member state to help the organization in enhancement of membership and Triangular Cooperation. Some specific points of meetings with these diplomats are given below.

Ambassador of Azerbaijan to Pakistan, H. E. Mr. Ali Alizada (3rd November 2017)

The Ambassador showed his interest in some collaborative cultural activities and desired to provide sponsorship for small projects of the COMSATS. He also showed keen interest in the scholarship offers by CIIT and hoped to

encourage Azerbaijani students to benefit from the quality education being provided by the Institution. In response to queries by the Ambassador regarding the scholarship, Dr. Zaidi suggested some useful options to facilitate admissions of Azerbaijani students, which could include a panel of admission officials from CIIT visiting Azerbaijan for on-the-spot admissions.

Ambassador of Argentina, H. E. Mr. Ivan Ivanissevich (24th November 2017)

During a short discussion session with Mr. Ivanissevich, Dr. Zaidi informed him about the Tele-health project of COMSATS, which caters to the healthcare needs of people in far-flung areas of Pakistan. He also discussed that this project provides tele-consultations in cardiology, radiology, dermatology, and urology. His Excellency opined that Argentina, having vast agricultural land, could employ such technologies in agriculture. The Ambassador mentioned that new technologies are getting cheaper and more sophisticated with every single passing day and COMSATS' projects are a due utilization of that.

Dr. Zaidi handed over to His Excellency a letter in connection with Argentina's accession to COMSATS. The Ambassador pledged to take up the matter of Argentina's accession with the Ministries of Finance, and Science and Technology for due consideration and political support.

Ambassador of Nepal to Pakistan, H. E. Ms. Sewa Lamsal Adhikari (24th November 2017)

Her Excellency Ms. Adhikari lauded the vision of Prof. Dr. Abdus Salam and appreciated the expansion of COMSATS' membership as well as the R&D at COMSATS' Centres of

Excellence.

Ms. Adhikari stressed upon the need of developing and promoting small technologies for the benefit of common people, in particular, from developing countries of South Asia. She expressed keen interest in COMSATS' tele-health services and expressed her desire to launch a similar project for the people of remote areas in Nepal. She opined that meaningful research in a number of fields can accelerate the development process. While highlighting the significance of renewable energy, she noted that solar energy and micro-hydel power has mitigated electricity crisis in less privileged areas of Nepal.

Taking note of the prior correspondence between COMSATS and Ministry of S&T, Government of Nepal, and Nepal's Chemical Society, the Ambassador pledged to sensitize the Government of Nepal and the concerned authorities about the importance Nepal's accession to COMSATS, during her visit to Kathmandu in December 2017.

Ambassador of Morocco to Pakistan, H. E. Mr. Mohamed Karmoune (27th November 2017)

Morocco is a relatively recent member of COMSATS as it joined the organization as a Member State during mid-2015. The Ambassador of Morocco was asked for his cooperation to help ensure Morocco's participation in the 21st Coordinating Council Meeting to be held in Kazakhstan during 2018.

Mr. Karmoune mentioned that without collaboration in education and science, countries cannot progress, and, therefore, he considered it important for Morocco to have



Representatives of Foreign Missions of Azerbaijan, Argentina, Nepal, and Morocco at COMSATS Secretariat

good ties with COMSATS' Member States and Network of Centres of Excellence. His Excellency hoped to explore further avenues of mutual cooperation between COMSATS and Morocco. He pledged his support for improving the participation of Morocco in the programmes and activities of COMSATS.

Discussing the possible avenues of cooperation between COMSATS and Morocco, Dr. Zaidi suggested establishment of a high-quality research and development institute in Morocco, for which due support and expertise can be harnessed. He also considered it important to have more frequent exchanges and interactions of scientists between Morocco and other member states of COMSATS.

High Commissioner of Pakistan to Australia, H. E. Mrs. Naela Chohan (29th December 2017)

The High Commissioner gave her inputs regarding possible collaborations with Australian universities and institutions, United Nations Sustainable Development Goals, scholarship programmes, and brain drain. She mentioned that COMSATS can collaborate with Australian universities for bilateral exchange programmes and scholarships for the students, for which she pledged to support COMSATS through her office. She also discussed the Memoranda of Understanding signed by CIIT and the Australian universities, which she considered a way forward for exchange of information and resources. Her Excellency pledged to facilitate implementation of the MoUs on the other side.

The High Commissioner agreed to take a letter from the Executive Director COMSATS to Pacific Islands Development Forum (PIDF) to seek collaboration based on the important areas of interests for collaborations between the two organizations.



The High Commissioner of Pakistan to Australia during a meeting with Officials at COMSATS Secretariat

Experts from the North Visit COMSATS Secretariat

Dr. John Kirkland, formerly associated to the Association of Commonwealth Universities (ACU), UK, as Deputy Secretary General, visited COMSATS Secretariat in Islamabad. Decorated with the Order of British Empire, Dr. Kirkland has an experience of over 30 years in higher education management, and provides consultancy to universities, international organizations and funding agencies. The expert was received at COMSATS Secretariat, Islamabad, by the Executive Director COMSATS, and other COMSATS' officials on December 11, 2017.

Speaking to COMSATS' officials, Dr. Kirkland appreciated the range of developing countries that are members to COMSATS. He considered it important to have the organization's mandate, role, and contributions more widely known for a better and wider impact.

He took keen interest in what he called 'the period of change' that COMSATS is going through and showed his willingness to help in the expansion of the organization. Appreciating the existing contributions of COMSATS, Dr. Kirkland especially mentioned COMSATS Institute of Information Technology (CIIT) and considered it well-connected with the institutions in the North.

Later, a delegation of British Council comprising of Mr. John McGovern, Consultant at British Council, UK, Ms. Liz Dempsey, Advisor at British Council, Manchester, and Mr. Hamza Salim, Project Manager at British Council Pakistan, joined the meeting. The primary purpose of their visit was to interview Dr. Zaidi for the Going Global initiative of the British Council in view of his vast experience and contributions towards the higher education sector in Pakistan a living example of which is COMSATS Institute of Information



Dr. Kirkland and Officials from British Council exchanging views with COMSATS' Officials

Technology. During a brief interaction with COMSATS' officials before the interview, Mr. McGovern appreciated the phenomenal growth of CIIT during its relatively short span of existence. He appreciated the quality of education and facilities provided by the institute at all of its campuses.

Ms. Dempsey highlighted the possible areas of cooperation between the institutions from the North and the South, which included mobility of students. She advised to have stronger networking and effective communication to get COMSATS' message across all stakeholders.

COMSATS' Officials Hold Meetings in Oman, Italy and China

Ties Established with Scientific Institutions of Oman

A five-member delegation of COMSATS Secretariat visited the Sultanate of Oman from 31st October 2017 to 2nd November 2017 in connection with signing a "Protocol of Cooperation" with Oman National Computer Emergency Readiness Team (OCERT). The delegation was led by Dr. S. M. Junaid Zaidi, Executive Director COMSATS. The delegation held a number of meetings during this period in different institutes.

On 1st November 2017, the delegation called upon H.E. Mr. Ali Javed, Ambassador of Pakistan in Oman, at Pakistan Embassy in Muscat, Oman. The meeting was also attended by Mr. Salman Athar, Deputy Head of Mission and Mr. Muhammad Ishaque, Counselor Trade and Education, Pakistan Embassy. The Ambassador warmly welcomed the delegation and gave a comprehensive briefing on the status of bilateral relations between Oman and COMSATS' Member State, Pakistan. Dr. Zaidi shed light on the operations and functions of COMSATS and its flagship projects, and expressed desire to establish formal linkages between COMSATS and relevant institutions in Oman. The subject of the Sultanate of Oman's membership to COMSATS was also discussed in detail and it was learned that the matter will be taken up at the appropriate forum and will be followed-up through the Embassy of Pakistan. Appreciative of COMSATS' efforts for South-South Cooperation, the Ambassador assured the Executive Director that he will duly sensitize the concerned officials of Oman.

Later, the delegation visited the Sultan Qaboos University (SQU), the biggest and the oldest Public Sector University in the Sultanate of Oman. Mr. Ishaq of Embassy of Pakistan also accompanied the delegation during this visit. The delegation held a meeting with Dr. Talal Khamis Al-Wahaibi,



COMSATS' delegation receiving a presentation at OCERT, Oman

Assistant Dean (Research), during which potential areas of future collaboration were explored in great detail.

On the same day, COMSATS' delegation, on the invitation of Pakistan Social Club (Pakistani Community forum in Oman) participated in the Young Leaders Forum (YLF) organized by the Embassy. The participants welcomed Dr. Zaidi's announcement for fully-funded scholarships to qualifying Pakistani students in Oman who wished to pursue their careers in the fields of Science & Technology and IT at CIIT.

Earlier in the day, the delegation was welcomed at Information Technology Authority (ITA), Oman, by Ms. Roqaya Al-Tobi, OCERT, and other senior officials of the ITA that followed a detailed presentation on ITA activities entitled 'e. Oman Strategy'. The delegation also visited OCERT, where senior OCERT officials welcomed the delegates and Ms. Roqaya gave a detailed presentation on OCERT's functions.

Visit to ICGEB, Trieste, Italy

A four-member delegation of COMSATS headed by Dr. S. M. Junaid Zaidi, Executive Director COMSATS, and comprising of Mr. Tajammul Hussain, Advisor (Programmes); Dr. Kamran Jahangir, Advisor (TAC); and Mr. Farhan Ansari, Senior Assistant Director (Programmes) visited the International Centre for Genetic Engineering and Biotechnology (ICGEB) Headquarters, Trieste, Italy, on 16th November 2017. They held a meeting with ICGEB Scientific Coordinator, Dr. Lawrence Banks, and other senior officials/scientists of ICGEB.

During the meeting, Dr. Zaidi indicated that COMSATS aspires to expand its Network and extend its outreach in pursuit of Triangular Cooperation. Dr. Zaidi solicited



COMSATS' delegation with ICGEB Officials in Italy

technical support from ICGEB for setting up of high quality biotechnology institutes in COMSATS' Member States.

After meaningful discussions and deliberation between the two sides, proposition was made to set up centres of excellence in COMSATS Member States akin to ICGEB Regional Research Centre (RRC) initiative. The participation of scientists from ICGEB in COMSATS' International Thematic Research Group (ITRG) on 'Agriculture, Food Security and Biotechnology' and ITRG on 'Renewable Energy' was highly encouraged by COMSATS' officials. The two sides agreed upon initiation of Joint Fellowship Programmes in respective Member States.

Interactions with Chinese Institutions

A four-member delegation from COMSATS visited People's Republic of China from 16th-22nd December 2017. The COMSATS' delegation was headed by the Executive Director COMSATS. Other members of the delegation included Ambassador Shahid Kamal, Head of CCRD-CIIT; Major General (R) Muhammad Tahir, Advisor; and Mr. Tajammul Hussain, Advisor (Programmes). The delegation met the Chinese authorities and Heads of various scientific institutions with the agenda to further strengthen the relationship in Research and Innovation between China and COMSATS.

A meeting with Director General of International Cooperation, Ministry of Science and Technology, Mr. Ye Dongbai, was held on 18th December 2017 at his office. During the discussion, the Director General MoST ensured due consideration of the matter of increase in AMC, on request from the COMSATS' delegation. Highlighting the capacity building and training programmes of MoST, China, the Director General asked COMSATS to nominate 5-8 scientists from the member states to participate in



Director General, International Cooperation, Ministry of Science and Technology, China with COMSATS' delegation

upcoming workshops at ICCES.

Another meeting during the day was held with Prof. Lin Zhou, Head, ICCES. The agenda of the meeting was to discuss future collaborations to step forward for socio-economic improvements and augmenting the efforts for South-South cooperation.

COMSATS' officials also met with the authorities of Chinese Academy of Sciences (CAS) on 19th December 2017 to discuss the matters of mutual interest. CAS ensured COMSATS' officials about providing financial and technical support to one of the Centres of Excellence of COMSATS. Both sides were optimistic about collaborations in future under the OBOR initiative.

The meetings with the officials of Ministry of Commerce, China, and Department of South-South Cooperation (SSC) were held on 20th December 2017 at the Ministry of Commerce, China, and Institute of Remote Sensing and Digital Earth (RADI), respectively. Head of Department of SSC, Ministry of Commerce, pledged to work with COMSATS in order to strengthen bilateral and multilateral collaborations with COMSATS' member states.

COMSATS' delegation met with Prof. Sun Jibin, Deputy Director, Tianjin Institute of Industrial Biotechnology (TIB), on 21st December 2017 to discuss the prospective induction of Tianjin Institute of Industrial Biotechnology (TIB) as a Centre of Excellence in COMSATS' Network.

International Workshop on Internet Security: Enhancing Information Exchange Safeguards, Almaty, Kazakhstan

The 7th International Workshop on 'Internet Security:



Head-table at the International Workshop on Internet Security, Almaty, Kazakhstan

Enhancing Information Exchange Safeguards' was held from 19th to 23rd December 2017, in Almaty, Kazakhstan. The event was jointly organized by COMSATS, ISESCO, and INIT, and was hosted by KazNU, Kazakhstan. The workshop was inaugurated by Prof. Dr. Tlekkabul Ramazanov, Vice-Rector for Research & Innovations, KazNU, on 19th December 2017.

The technical sessions of the five-day workshop were attended by 40 young researchers, academicians, system administrators and cyber security professionals, belonging to Kazakhstan, Bangladesh, Jordan, Mauritania, Iran, Pakistan, and Sudan. The event provided a forum to the participating researchers and professionals to learn about the latest advancements in the field of Internet security; use the state-of-the-art technologies for protection of network and network accessible resources from different types of software attacks; and working out effective Internet/information security solutions for general public, governmental organizations, and commercial enterprises through rigorous risk analysis and security management approaches.

Officials from TUBITAK-Turkey Visit COMSATS Secretariat

A Turkish delegation comprising of the President of the Scientific and Technological Research Council of Turkey (TUBITAK), Turkey, His Excellency Prof. Dr. Ahmet Arif Ergin; President of TUBITAK Marmara Research Centre (MAM), Turkey Dr. Orkun Hasekioglu; Chief of Staff, TUBITAK, Dr. I. Soner Karaca; and Head of Bilateral and Multilateral Relations Department, TUBITAK, Ms. Zeynep Arziman Buyukboduk, visited COMSATS Secretariat, on December 12, 2017.



Officials of TUBITAK, Turkey, meeting COMSATS' Officials

A meeting was held with the Executive Director COMSATS, Dr. S. M. Junaid Zaidi, in the presence of COMSATS' officials. Dr. John Kirkland, former Deputy Secretary-General at Association of Commonwealth Universities (ACU) also joined the meeting. The purpose of the meeting was to strengthen the ongoing collaboration between COMSATS and Turkey and to explore possibilities of new ones.

Dr. Zaidi sought the visiting officials' support for establishment of new and up-gradation of existing Centres of Excellence, as well as instituting a top-notch university in COMSATS' Member States. Further, he solicited support for dispatching officials of TUBITAK at COMSATS on secondment as well as experts to provide consultancy and advice for the execution of projects in COMSATS Member States.

In response to Dr. Zaidi's views and ideas, Prof. Dr. Ergin made a proposition of providing consultancy to COMSATS' Member States on cyber-security. He gave the idea of setting-up an institute similar in operation to ICTP, Italy, and proposed to replicate the project in Member States of COMSATS. He also pledged to facilitate the process of establishment of a varsity in any of COMSATS' Member States by providing technical support. Further, Dr. Hasekioglu showed TUBITAK's willingness to make available scholarships and fellowships to students and researchers of COMSATS' Member States.

Prof. Ahmet assured possible support for facilitation of networking between COMSATS and General Manager of TUBITAK's Technology Park. He further offered support in the form of technology transfer from TUBITAK to COMSATS' Network. He also expressed willingness to accommodate researchers belonging to other Centres of Excellence at TUBITAK MAM for trainings/research.

SPECIAL SECTION: THE FEDERAL REPUBLIC OF SOMALIA JOINS COMSATS AS ITS 26TH MEMBER STATE

The Federal Republic of Somalia has joined the Commission on Science and Technology for Sustainable Development in the South (COMSATS) as its 26th Member State after signing an accession agreement on 9th November 2017 at COMSATS Secretariat, Islamabad. The agreement was signed by His Excellency Mr. Abdi Dahir Osman, Minister for Education, Ministry of Education, Culture, and Higher Education, Somalia and Dr. S. M. Junaid Zaidi, Executive Director COMSATS in the presence of Her Excellency Ms. Khadija Almakhzoumi, the Ambassador of Somalia to Islamabad, Pakistan; Mr. Ali Sheikh, First Secretary, Embassy of Somalia; and Mohammed A. Nur, Advisor to the Ministry of Education, Culture, and Higher Education as well as senior officials from COMSATS.

By virtue of this membership, Somalia will be represented at the Heads-of-State level Commission of COMSATS and the ministerial-level Consultative Committee. The country will also have the representation at COMSATS' technical cooperation forum, the Coordinating Council. Somalia would now also be able to benefit, inter alia, from COMSATS' scholarships schemes to study at COMSATS' Network Members including COMSATS Institute of Information Technology (CIIT), as well as joint research under COMSATS International Thematic Research Groups. The Minister of Education, Culture, and Higher Education, Somalia has been designated as the focal person of COMSATS in the country.

The Ambassador of Somalia to Pakistan, H.E. Mrs. Khadija Mohamed Almakhzoumi made considerable efforts towards the induction of Federal Republic of Somalia to fraternity of COMSATS. On 2nd October 2017, Her Excellency visited COMSATS Secretariat in order to discuss potential areas of cooperation between Somalia and COMSATS. During that meeting, Dr. Zaidi elucidated Her Excellency the benefits and obligations of joining COMSATS as a member state. He stated that Somali students can enjoy the benefits of Somalia's

membership to COMSATS by availing the scholarships for COMSATS' Member states and collaborations with Centres of Excellence in broader spectrum. Somalia can also extend its international outreach and networking through COMSATS' platform as the Organization has linkages with several prominent international organizations. During the meeting, The Ambassador was also presented with a letter for accession, marked to the Minister of Education, Culture and Higher Education, which was followed up and led to the signing of the accession agreement.

A letter of acceptance addressed to Dr. S.M. Junaid Zaidi was received from the Embassy of Somalia on 20th October 2017. In the letter, The Ambassador of Somalia to Pakistan assented to sign the membership and accession documents on behalf of the Government of Somalia. The letter reflected the eagerness of Somalia to participate in the partnerships and technical efforts catalyzed by COMSATS notwithstanding the unstable socio-economic conditions of the country. It was also elucidated in the letter that Government of Somalia shall make efforts to affiliate Somali National University and other higher education institutions in Somalia with COMSATS.

In order to celebrate the accession of Federal Republic of Somalia to COMSATS, a reception was hosted by Executive Director COMSATS on 8th December 2017. The Ambassador of Somalia to Pakistan, Ms. Khadija Almakhzoumi graced the reception with her presence. Foreign diplomats in Pakistan, esteemed representatives from the Ministries of S&T and Foreign Affairs, Pakistan, representatives from Pakistan based and international organizations as well as officials from COMSATS were also present at the event.

While speaking to the audience at the reception, Dr. Zaidi welcomed Somalia to COMSATS' fraternity and asserted the need to have stronger international collaborations to help



Minister for Education, Ministry of Education, Culture and Higher Education, Somalia, and Ambassador of Somalia to Pakistan with Officials of COMSATS Secretariat after the Signing Ceremony



ED COMSATS and Ambassador of Somalia to Pakistan speaking at the reception

overcome common challenges of the developing countries. Highlighting COMSATS' functions and contributions of COMSATS towards member states, he mentioned COMSATS Institute of Information Technology (CIIT) and COMSATS Internet Services (CIS) as two of its important flagship projects worth emulating in other member states. He noted that the organization has been working to uplift the members of COMSATS' International Network of Centers of Excellence and a lot of its activities are in line with the SDGs. He also thanked the Institute for Peace and Diplomatic Studies (IPD) for their efforts in helping expand COMSATS' membership.

Speaking on the occasion, H.E. Ms. Khadija Almahzoumi extended gratitude and expressed pleasure that being a member Somalia will now be able to benefit from a number of opportunities available with COMSATS and looked forward to the country being an active part of the organization's international activities. She considered COMSATS an excellent platform for S&T South-South cooperation and considered CIIT a 'sea of knowledge'.

The reception ceremony was also marked with the ceremonious exchange of flags of Somalia and COMSATS between Her

Excellency and Dr. Zaidi.

On the sidelines of the reception ceremony, the Executive Director COMSATS held an informal meeting with the Ambassador of Somalia to Pakistan, Her Excellency Ms. Khadija Almahzoumi, and Board Member, Somali-Swedish Researchers Association, Mr. Khalif Bile, in the presence of senior officials of COMSATS Secretariat.

During the meeting, Dr. Zaidi expressed his pleasure on having Somalia as a new member state of COMSATS and desired to initiate collaborations with Somali institutions based on a work plan. He suggested that the health services in Somalia can be improved with projects like Tele-Health, for which COMSATS can provide expertise as well as support. He also noted that a top notch university like CIIT can be established in Somalia as a collaborative project.

Dr. Bile was very receptive of the suggestions of Dr. Zaidi and agreed to the recommended areas of collaboration including e-Health, which he considered can be utilized for providing e-health services and enhancing research in Somalia. The Somali Ambassador nominated Councilor of the Embassy of Somalia, Mr. Abdullahi Haji Daud Warsame, as the focal person, while Mr. Nisar Ahmad, Deputy Director (Systems) was nominated as COMSATS' focal person.

Dr. Bile mentioned that the designated focal persons should discuss provision of scholarships and possibilities of collaborative programmes between COMSATS and Somalia to start the exchange of information.

The Executive Director proposed that an official from Somalia may be placed at COMSATS Secretariat on secondment. For this he requested the Ambassador to take the case to the concerned authorities.

Dr. Zaidi also requested Dr. Bile to provide his expertise for designing collaborative projects.



August gathering of Foreign Diplomats at the Reception



A post-reception Working Group Meeting with Somali Officials

MEMBER COUNTRY IN SPECTRUM

The Republic of Somalia



The Federal Republic of Somalia is the newest member of COMSATS. It is located in the East Africa. The country is bordered on the West by Ethiopia, on the Northwest by Djibouti, on the North by Gulf of Eden, on the East by Indian Ocean, and on the Southwest by Kenya. Strategically located at the mouth of the Bab el Mandeb gateway to the Red Sea and the Suez Canal, the country occupies the tip of a region that, due to its resemblance on the map to a rhinoceros' horn, is commonly referred to as the Horn of Africa. In the Africa's mainland, Somalia has the longest coastline and its terrains comprise of plateaus, highlands, and plains. The country has a total area of 637,657 square kilometer.

Due to Somalia's proximity to the equator, there is not much seasonal variation in its climate. Hot weather prevails in the country throughout the year with periodic monsoon winds and irregular rainfall. Due to its geographical and climatic diversity, Somalia is home to variety of mammals and birds. Territorial waters of the country are prime fishing grounds for highly migratory marine species such as tuna.

Somalia is a parliamentary representative democratic republic. The President of Somalia is the head of state and commander-in-chief of the Somali Armed Forces and selects a Prime Minister to act as head of government. The Judiciary of Somalia is defined by the Provisional Constitution of the Federal Republic of Somalia. Around 85% of the residents in Somalia are ethnic Somali Muslims. The official languages spoken in the country are Somali and Arabic, both having Afro-asiatic background. Non-Somali ethnic minority groups make up the remainder of Somalia's population, and are largely concentrated in the southern regions. They include Bravanese, Bantus, Bajuni, Ethiopians, Indians, Persians, Italians and Britons. The Bantus, the largest ethnic minority group in Somalia, are the descendants of slaves who were brought in from southeastern Africa by Arab and Somali traders.

As per estimates from the World Bank, Somali population was over 11,031,386 (World Bank Report, 2017). The annual population growth rate of Somalia is 2%. The largest segment of the country's population (43.15%) is aged under 14 years followed by population segment (31.43%) aged between 25 to 54 (CIA World Factbook, 2017).

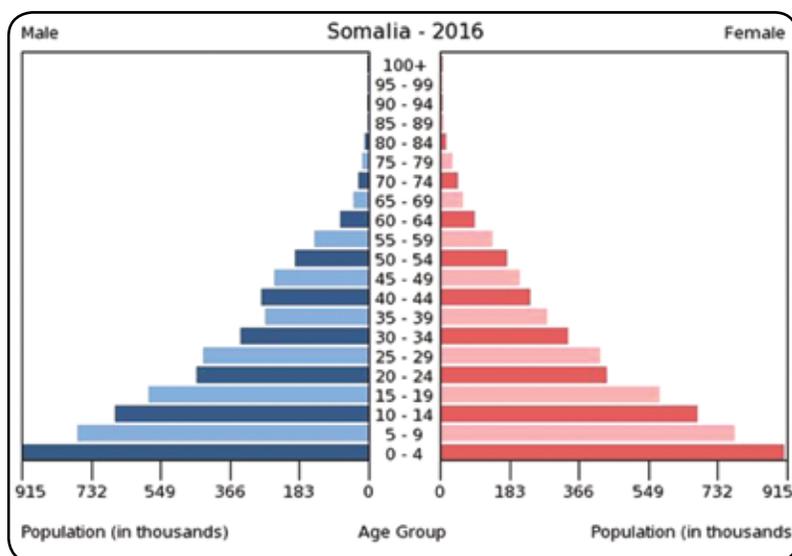
The country is blessed with natural reservoirs of uranium, iron ore, tin, gypsum, bauxite, copper,



salt, natural gas, and oil reserves. Around 70.3% land of Somalia is agricultural. The country has a wide range of produce, including bananas, sorghum, corn, coconuts, rice, sugarcane, mangoes, sesame seeds, beans; cattle, sheep, goats, and fish.

Somalia produces various industrial products, like sugar, textiles, wireless communication hardware.

Agriculture is the most important sector, with livestock normally accounting for about 40% of GDP and more than 50% of export earnings. Nomads and semi-pastoralists, who are dependent upon livestock for their livelihood, make up a large portion of the population. Economic activity is estimated to have increased by 3.7% in 2016 because of growth in the agriculture, construction and telecommunications sector. Somalia's small industrial sector, based on the processing of agricultural products, has largely been looted and the machinery sold as scrap metal.



The city of Mogadishu has used for connecting Europe, North America, and East Africa through EASSY fiber-optic cable system which marked the most expensive satellite dependent access of the country Arabs (CIA World Factbook, 2017).

Exports of Somalia are largely based on livestock, bananas, hides, scrap metal, charcoal, and fish, while imports include petroleum products, construction materials, and food stuffs. Somalia is in trading relationships with Saudi Arabia, Oman, United Arab Emirates, India, China, Kenya, Turkey, Malaysia, and Brazil.

Despite the lack of effective national governance, Somalia maintains an informal economy largely based on livestock, remittance/money transfer companies, and telecommunications. Somalia’s government lacks the ability to collect domestic revenue and external debt – mostly in arrears – was estimated at 93% of GDP in 2014 (CIA World Factbook, 2017).

In Somalia, the indigenous experts have begun returning to their homeland to invest in the economy after significant notice of improvement in Somalia local security. This has yielded positive investment opportunities along with the interest of the foreign investors. Within the last three years the GDP of the nation has been tremendously maintaining a percent of 3.4 in spite of the harsh environment. The newly elected government is striving to return the stability and substantial economy of the country since over years the economy had dependent solely on foreign aid, remittances from the Somali expertise and agriculture.

The Ministry of Education is officially responsible for education in Somalia, and oversees the nation’s primary, secondary, technical and vocational schools, as well as

Key Development Indicators of Somalia				
Development Indicator	1990	2000	2010	2016
Population, total (millions)	7.4	9.01	12.05	14.32
Population growth (annual %)	1.3	3.3	2.9	2.9
Urban population growth (annual %)	2.5	4.4	4.1	4.1
Agriculture, value added (% of GDP)	65	-	-	-
Exports of goods and services (% of GDP)	10	-	15	15
Imports of goods and services (% of GDP)	38	-	62	63
Mobile cellular subscriptions (per 100 people)	0	1.1	6.7	58.1
Individuals using the Internet (% of population)	0	0	1.3	1.9
High-technology exports (% of manufactured exports)	2	3	5	6

Source: World Bank Indicators, 2017

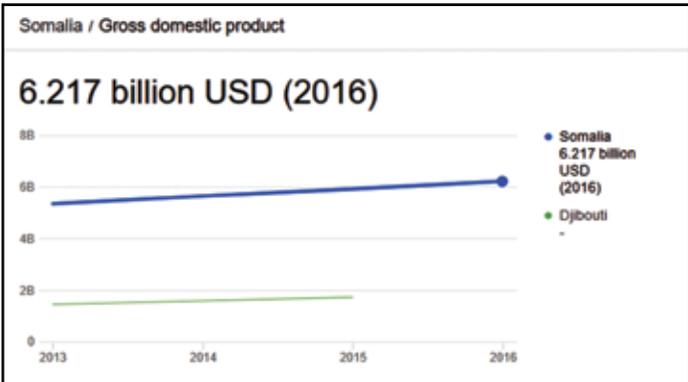
primary and technical teacher training and non-formal education. The Minister of Education, Culture and Higher Education, is the focal point of COMSATS in Somalia.

The inflow of funds contributes to the value gained by the national currency (Somalia shillings) and appreciated up to 60% against US dollars. Somalia established a Somali petroleum corporation in preparation of future certainty of the country unexploited reserves of oil due to its proximity and geological similarity as compared to the oil rich Gulf Arab states. Although, in 2011 the CIA declared no proven reserves of oil in the nation but the suggestion made by the UNCTAD says most of the proven oil reserves in the country lie off its northwestern coast, in the region (African Development Bank, 2016).

Great effort has been made since the civil war to establish the institutions of higher learning and in 1999, two institutions were opened with the mission of reviving the country education. The educational system of Somalia is structured and regulated by the Ministry of Education, from primary school to tertiary level of study including teacher-training and non-formal education. Although, most of the activities and the affairs of the higher institutions has been handled by the private investors (capitalist) but many of the universities including the University of Mogadishu have triumphed in ranking among the top 100 universities in Africa.

Somali Institute for Development and Research Analysis (SIDRA) deals with the science based research and development in the country.

Somalia is in its way to make achievement in highly competitive global economy through enhancement of quality education services for the development.



Source: World Bank Report, 2017

ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

Largest Ever Science Gathering in the Middle East for World Science Forum 2017 hosted by RSS-Jordan

Over 3,000 science leaders from over 140 countries gathered at the World Science Forum 2017 in Jordan from November 7 to 10, to call for a more responsible and ethical use of innovation, and to address the social and economic relevance, influence, and responsibilities of science. The World Science Forum was organised in collaboration by the Royal Scientific Society (RSS) of Jordan; United Nations Educational, Scientific, and Cultural Organization (UNESCO); Hungarian Academy of Sciences (MTA); American Association for the Advancement of Science (AAAS); World Academy of Sciences (TWAS); European Academies Science Advisory Council (EASAC); International Council for Science (ICSU); Inter-Academy Partnership (IAP); International Social Science Council (ISSC); and Science Counsellor representatives of the G77.

At the Opening Ceremony of World Science Forum (WSF) 2017 under the theme of 'Science for Peace' a panel of global thought-leaders declared renewed intent to fight poverty and promote just, equitable and inclusive social development based on the restoration, protection and sustainable use of natural resources and ecosystems to promote greater peace and social harmony.

His Majesty King Abdullah II Ibn Al Hussein of the Hashemite Kingdom of Jordan and Patron of WSF 2017 opened four-day of plenary sessions, short seminars and individual lectures, addressing a large audience of diplomats, global science stakeholders and key influencers.

During the Opening 'Science for Peace' Plenary, South African Minister for Science, Naledi Pandor warned against complacency:



President of Royal Scientific Society, COMSATS' Centres of Excellence in Jordan, Princess Sumaya at the WSF 2017

"No country, no region can afford isolation. Our problems are also our neighbour's problems. HIV/ Aids, malaria and tuberculosis are on the rise in regions previously considered to be safe from their disease burden, whilst non-communicable including lifestyle diseases now have a devastating impact in the developing world. More than ever we need greater global solidarity to confront rising, unacceptable and very dangerous inequalities. Science has a crucial role to play in our responses to all these societal challenges and strong international cooperation will be essential. The World Science Forum is a critical platform to foster intensified collaboration, also ensuring the science contributions from developing countries play their much needed, rightful part."

WSF 2017 set new standards in igniting self-critical conversations about the applications of science for all of society. Perhaps the most representative of the flagship global generalist conferences, every effort was made to ensure that all regions are represented and that all voices were given the chance to be heard. Not only did the panels comprise of the talking heads of the world's large research infrastructures and membership bodies, science ministers and their advisers, but experts from academia, entrepreneurship, civil society, young researchers and media were equally invited to discuss critical global issues. Several speaker organisations also used WSF as a platform to announce the latest findings in environmental and health sciences.

This year's programme of WSF offered 8 plenary sessions. The main theme throughout all discussions was a 'sustainability development goals update & critique', bringing together leading decision-makers to take stock of progress made towards the UN's 2030 Agenda. In this regard, two plenaries dealt with 'the energy/water nexus: intelligent management for sustainability & fairness' and 'science & food security: how to feed the world sustainably & equitably'.

There was a strong focus on science business and the innovation ecosystem to bring about the SDGs where the views of innovators, educationalists and economy-watchers collide. For example, plenaries on the 'opportunities & challenges of digital transformation' or 'building resilience in an inter-connected world' brought these discussions to the fore. Confidence in science and communicating with society remain a backbone of WSF meetings where issues of ethics and scientific integrity were hotly debated. 'Promoting inclusion through science education, outreach and engagement' was tackled, alongside a mini-Gender Summit as a first for WSF. A timely discussion on 'rebuilding broken societies through reconstruction & recovery' was also expected to capture the mood of this year's gathering. The end of conference plenary brought together well-known



His Majesty King Abdullah II Ibn Al Hussein and other distinguished guests at the Inauguration

fundors and the 'suppliers' of public research to examine the pros and cons of 'science diplomacy to strengthen governance & build enduring relationships'.

15 thematic sessions were offered

Over 150 organisations were invited to enrich questions and answers style-debates with delegates on a broad range of topics. From 'fighting resistant bacteria & global pandemics'; the latest in 'food & nutrition' or 'disaster risk reduction at heritage sites' and 'science for cultural relations'; to insights into 'the journey of refugee scientists', 'brain drain in developing countries' or 'science advice & alternative facts', a truly 'who's who' of experts were on-hand at WSF 2017.

22 special sessions were offered

A particular feature of WSF was its readiness to engage and encourage third-party groups to maximise its unrivaled meetings opportunities. For example, three separate regional panels were being held at ministerial and science-led, civil-society level covering Latin America & the Caribbean, the Africa-55 nations and the Arab region. From the latest on 'artificial intelligence and future healthcare systems' and 'development aid versus own resources' to 'combating extremist ideology', 'using science for peace in the Middle East', or 'talking science to non-scientists', few other platforms offered this depth and range of expertise to interrogate the true value of science, society and policy and the inter-play between them.

More side-events and high-level meetings than ever-before facilitated

WSF 2017 acted as a catalyst for meetings of global science policy practitioners, offering unprecedented support to early career researchers, and hosted a forum bringing together the organisers of the world's largest science conferences to share updates and best practices. Everything was done

to ensure that the next generation of decision-makers are at the heart of discussions in Jordan. For example, to help promote science communication, science media grants were offered to 25 promising journalists to join their peers at the conference. In this way, specific scientific or diplomatic networks, established projects or emerging forces can broaden their visibility, appeal and memberships.

Forum outcomes

The legacy of WSF 2017 was indeed an unequivocal wake-up call to scientists and diplomats to better understand the impacts their findings and policies were having on the natural and social systems of the earth. In this regard, the conference brought forth a declaration of outcomes announced on 10th November 2017. They are as below:

1. *The equitable and sustainable management of natural resources is essential to avoid conflicts and to promote peaceful development.*

We affirm the need to collaborate to improve governance, to inform technological choices and investments, and to build social and human infrastructures for equitable and sustainable management of resources.

We endorse the three landmark UN agreements adopted in 2015 — the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction 2015–2030, and the Paris Agreement on Climate Change. We call for science to be given a central role in enabling the analysis and synthesis of evidence to inform their implementation, delivery, and compliance through research monitoring and evaluation.

2. *The preservation of scientific capacities, threatened by global migration trends, is key to peace, sustainable development, resilience and recovery.*

We call on science organizations, universities and governments to devise mechanisms to identify professionals among the millions displaced by war, economic hardship and climate change, and set recommendations that protect their status and their ability to create knowledge.

We underline the need for education and jobs programs to support mobility and integration of migrant and refugee researchers and students.

We call for the inclusion of migrant and refugee researchers in the negotiation process of the Global Compact for Safe, Orderly and Regular Migration due to be signed by UN Member States in 2018.

3. Diversity is a key enabler of excellence in science, technology and innovation and is essential to optimize its relevance and impact.

We call for the recognition and promotion of diversity in science as an essential precursor to fully realizing the potential of human capacities globally, to cherishing excellence, and to optimizing the impact of scientific research for the benefit of humankind.

We advocate for innovative measures and the assessment of gender-disaggregated data, as well as support for the design and implementation of science, technology and innovation (STI) policy instruments that positively affect gender equality in STEM.

4. We commit to the fulfilment of the universal right to science.

We, the partner organizations of the World Science Forum, and all participants of World Science Forum 2017, commit to defend academic freedom.

We embrace the Principle of the Universality of Science adopted by ICSU member organizations, the renewed Recommendation on Science and Scientific Researchers



Executive Director COMSATS during a meeting with Prince Hassan bin Talal and Princess Sumaya on the sideline of WSF 2017

adopted by UNESCO, the Statement on Scientific Freedom and Responsibility adopted by AAAS, and IAP's Doing Global Science: A Guide to Responsible Conduct in the Global Research Enterprise.

We call for the stakeholders of science to join together in promoting and communicating the universal right to science as an essential precursor to building a fair and durable peace.

5. We support the launch of a regional science forum for the Arab World.

We support the launch of an Arab Science Forum to draw together science and research communities, to focus scientific capacity to address regional challenges, and to connect regional science voices to the wider discourse of established regional fora.

We, as partner organizations and participants of World Science Forum 2017, commit our support to the establishment of the Arab Science Forum.

For the full text of the declaration please visit: www.worldscienceforum.org



R&D Activities at COMSATS' Centres of Excellence

Scientists at UCAD-Senegal design a Software that assists Mathematics Education

On 4th December 2017, Michel Seck, a PhD student at Department of Mathematics and Computer Science, Cheikh Anta Diop University, Dakar, Senegal, developed a software named 'Simula'. The software allows both secondary and higher education teachers to prepare lessons and correct the exercises. Students can also use it to do exercises and check corrections. In short, it is an improved calculator by Senegal's National Mathematical Commission, which is about to be validated. The tool simplifies mathematics teaching. With this software, users can do analysis, linear algebra, Groebners bases, number theory, 2D and 3D graphs, probability, statistics, arithmetic networks and correction codes. This software has nearly 120,000 lines of code.

IRCC-Sudan Establishes Soybean processing pilot plant

In collaboration with the United Nations Industrial Development Organization (UNIDO), the Government of Japan and the Ministry of Industry, Industrial Research and Consultancy Centre (IRCC), Sudan, has established and operationalized Soybean Processing Pilot Plant in its premises. The plant has been established as part of a project titled 'Supporting Food and Nutrition Security in Sudan through Soybean'. This project addresses the local production and processing of soybean in Sudan, and comes in line with the national priorities reflected in the ongoing Country Program implemented by UNIDO. The project selected and supported up to 30 small-holder farmers to cultivate and produce local soybean varieties.



Soybean Processing Pilot Plant installed in IRCC, Sudan

IRCC prepared economic feasibility studies for soybean products in the Sudanese Market. The Centre is looking forward to cooperating with COMSATS for the programme.

TUBITAK MAM-Turkey works on Resistant Starch against Obesity and Diabetes

TUBITAK Marmara Research Center (MAM), Turkey, developed a starch-added flour to help prevent ever increasing rates of obesity and diabetes in Turkey. The new products "Starch-added Diet Flour" and "Starch-added Diabetic Flour" were introduced at Halal Expo 2017 event. This starch cannot be digested in small intestine but can be fermented in large intestine. It resembles dietary fibers in terms of health effects. In addition to having prebiotic properties, the products affect bowel health positively owing to their production of butyrate and other short-chain fatty acids. The products containing resistant starch with 50% lower energy than regular starch give a feeling of satiety and thereby control the appetite and help balance the blood sugar. Resistant starch products can be consumed by everyone, as they do not have any side-effects.



Introduction of Resistant Starch against Obesity and Diabetes on Halal Expo 2017

NRC-Egypt Crop Genetic Modification

National Research Centre (NRC), Egypt researchers have made two advances that could increase the national production of wheat in a country that is sometimes cited as the world's largest wheat importer. One of the advances involves a new compound that would be used to treat wheat seeds. The other involves the genetic manipulation of the wheat seeds themselves.

The researchers obtained a patent for the new compound, which includes micro-organisms that could increase wheat yields in arid and semi-arid regions by as much as 68 percent. The new compound would contribute to

increasing wheat productivity by making it possible to plant wheat in completely arid lands. The compound will increase production by reducing stresses on wheat as it grows, and increasing the concentration of raw protein and carbohydrates in wheat grains. It will also inhibit bacteria and viruses in the soil that attack wheat and increase plant resistance to disease.

The research team treated the seeds with the compound before they were planted to get the maximum possible benefit. The plants were also sprayed with the compound after germination to form a layer on the leaves, which improved growth and protected against the effects of climate change and other environmental stresses.

Experiments to test the compound were conducted during two agricultural seasons on two of Egypt's wheat types grown in the Sinai Peninsula and in the Beheira governorate North of Cairo. These places are known for their drought conditions.

Rector of Al-Farabi KazNU-Kazakhstan, meets COMSATS' Delegation

On December 19, 2017 a meeting was held between Prof. Galimkair Mutanov, the Rector of Al-Farabi Kazakh National University (KazNU), Kazakhstan, and a delegation of the COMSATS, including Mr. Farhan Ansari, Senior Assistant Director (Programmes), COMSATS; and Senior Programme Officer (P&D and HRD), INIT, Muhammad Atiq-ur-Rehman.

During the meeting, Prof. Mutanov stressed the need to introduce new technologies, develop digitalization and competence centers based on research universities, as well as to implement the "Digital Kazakhstan" programme. He also highlighted that the work on information

protection and study of latest IT technologies. These technologies are designed to allow Kazakhstani scientists to use nanotechnologies for increasing cyber-security in information exchange, conducting advanced research, creating more accurate models of complex processes, and analyzing the increasing amounts of data obtained as a result of experiments. He also informed that the technopark, under the New Silk Road Alliance of Universities, is being established by creating a center of super-computer and cloud computing in KazNU.

The COMSATS' officials also discussed the details of the 21st meeting of COMSATS Coordinating Council, which is to be held in KazNU in April 2018.

KazNU-Kazakhstan signed a treaty 'Green Bridge Through Generations' with Russian Universities

The universities of Russia and Kazakhstan signed a treaty titled 'Green bridge through generations' on 9th November 2017. From Kazakhstan the agreement was signed by Al-Farabi KazNU and from Russia B. N. Yeltsin Ural Federal University signed. With the signing of this treaty, all universities of Russia and Kazakhstan aim at development of green technologies and training of highly qualified specialists, and conducting of scientific research. The Treaty is a major step to unite the efforts of the universities of the two countries.

EMBRAPA Agrobiologia-Brazil welcomes Ghanaian Scientists for Research on Inoculant Production

On November 27, 2017, researchers from Ghana visited EMBRAPA Agrobiologia, Brazil in order to learn about the process of inoculant production and benefits of Rhizobium inoculant technology among small holder vegetable farmers. The Ghanaian researchers were informed about the industrial value of inoculant production in the country, through visits to inoculant production industries in Brazil.

The knowledge shared during the visit will help in expansion of inoculant production industry in Ghana, which is under the phase of transition from micro industry to large industry. The team was given demonstrations for development of new inoculants for crops, including cowpea, peanut, and Bambara, and to study the effectiveness of field inoculation in the country.



Rector KazNU with COMSATS' Delegation

ICCES-China hosts delegation from International Centre Of Physics (CIF), Colombia

Dr. Jamie Erazo from the International Centre of Physics (CIF), Colombia, visited International Center for Climate and Environment Sciences (ICCES), China on December 6, 2017. The aim was to foster a long-term cooperative mechanism based on the existing links between these two COMSATS' Centres of Excellence, and explore collaborative potential by seeking international support from COMSATS, TWAS, and other funding resources from their countries.

Dr. Erazo and ICCES scientists discussed matters of mutual interest. Dr. Erazo proposed joint research project focusing on climate change and disaster modelling in order to better cope with the climatic and environmental hazards in Colombia, with the help of ICCES experts. ICCES officials suggested having access to the satellite and meteorological observation data from Colombian authorities to conduct joint research. Furthermore, a preliminary dialogue on the joint international conference or training workshop was also held.

CIIT-Pakistan Fosters Collaborations with Foreign Institutions

Eng. Wassfi Hassan El-Sreihin, Secretary General, African – Asian Rural Development Organization (AARDO) paid a visit to COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan, on December 11, 2017. Mr. Israr Muhammad Khan, Director National Centre for Rural Development (NCRD), Pakistan, was accompanying the Secretary General. A meeting was held between Secretary General AARDO and the Rector, CIIT, Prof. Dr. Raheel

Qamar, who discussed different achievements of CIIT in the fields of academics and research as well as its international rankings among the inter-regional universities. The rector offered expertise of CIIT in fields of e-Learning, Biotechnology, Environmental Sciences & Water Sanitation, Physics and Computer Science. The Secretary General AARDO emphasized that AARDO's platform is open for young faculty and research students of CIIT for capacity-building and other training programmes organized across different regions of the world.

On 30th November 2017, the International Office, CIIT in collaboration with the German Embassy organized a briefing session titled "Studying in Germany". Mr. Lars Berg Meyer, Director, German Academic Exchange Service (DAAD), Islamabad office, the guest speaker at the session, delivered a detailed and comprehensive presentation on "Study and Research" in Germany including the educational opportunities under DAAD as well as funding opportunities by other German organizations. Around a hundred participants attended and benefited from the event.

On 28th November 2017, CIIT welcomed a two-member delegation of Tsinghua University, China, comprising of Prof. Wei Zhang, Vice Dean & Director "Education Center of Master of Engineering Management (MEM)" and Ms. Lareina Liu, Project Manager, Tsinghua-Berkeley Shenzhen Institute (TBSI). Tsinghua officials proposed to initiate a university-to-university collaboration, whereby CIIT and TU or TBSI may co-design, co-deliver and co-share the teaching and supervision of two programmes namely: i). International Master of Engineering Management, and ii). TBSI programmes offered in the three fields: Environment Science and New Energy Technology, Big Data/Data Science, Health Care and Precision Medicine.

ICCBS-Pakistan inks an MoU with SKLCMEMR, China

The International Center for Chemical and Biological Sciences (ICCBS), Pakistan has inked a Memorandum of Understanding (MoU) with the State Key Laboratory for Chemistry and Molecular Engineering of Medicinal Resources (SKLCMEMR), Guangxi Normal University, China in a ceremony held at Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) of ICCBS on 27th November 2017.

Under this agreement, the signing institutions would make joint efforts for establishment of a Sino-Pakistan Joint International Laboratory for Chemistry and Molecular Engineering of Medicinal Resources at ICCBS.



Briefing Session between the delegation of Tsinghua University and Officials of CIIT

President Guangxi Normal University Prof. Dr. He Zu-Bin, Director of SKLCMEMR, Prof. Dr. Liang Hong, and Director ICCBS, Prof. Dr M. Iqbal Choudhary, signed the agreement on behalf of their institutions.

ICCBS-Pakistan Scientists win awards from American Heart Association

The American Heart Association (AHA), United States, has awarded “Paul Dudley White International Science Team Award” to five Pakistani scientists for their poster presentation. This award recognized Pakistani authors with the highest ranked abstract of posters at the scientific session 2017 held in California.

The award was presented at a scientific session 2017 held in California from November 11 to 15, 2017. Three of these scientists belong to International Center for Chemical and Biological Sciences, Pakistan. These were: Associate Professor, Dr. Asmat Salim, Dr. Irfan Khan and Rida-e-Maria Qazi.

New Partnership Programme between IRCC-Sudan and UNIDO

A delegation from the UNIDO, Vienna, visited IRCC on 16th December 2017 for cooperation for R&D in Cleaner Production in Sudan. IRCC submitted proposal for the establishment of Sudan Centre for Cleaner Production (SCCP) in December 2014 to ensure the continuous implementation of an integrated preventive environmental strategy to process products and services. The aim is to increase eco-efficiency and reduce risks to human and environment.

The visit concluded with an Agreement on the Resource of Efficiency and Cleaner Production in Sudan.



Members of IRCC and UNIDO during their meeting in Sudan

TUBITAK MAM-Turkey Organizes Joint Workshop with Slovak Academy of Sciences

TUBITAK Marmara Research Center (MAM), Turkey hosted a joint workshop with Slovak Academy of Sciences (SAS) on 12-13 November 2017 at TUBITAK’s campus in Gebze. The workshop was attended by 13 managers and researchers from the Republic of Slovakia and more than 40 representatives from TÜBİTAK, various universities, research centers and private sector companies.

During 4 sessions of the 2-day workshop, project ideas were discussed and presentations were made on ways to improve the academic cooperation between Turkey and Slovakia. At the end of the sessions, the moderators delivered presentations on the results. The sessions yielded various project proposals in the areas of materials science, nanotechnology, chemical technologies, food science, medicine, genetics, and biotechnology.

Al-Quds University-Palestine and eCampus University-Italy hold joint Conference

Al-Quds University, Palestine, and eCampus University, Italy, co-organized the first international conference titled “Bridging the future: the Women’s perspective” on 2nd December 2017 in Naples, Italy. The conference, which was a culmination of a strategic partnership agreement signed last month between the two universities, was opened by Abu Kishek, President Al-Quds University, and Prof. Imad Abu Kishek, President eCampus. Several prominent figures from the Kingdom of Saudi Arabia, Egypt, Italy, Tunisia, Greece, Lebanon, Morocco, and Jordan also attended the conference. President Abu Kishek’s expressed Al-Quds University’s desire to host the next conference at the university in Jerusalem, to continue the dialogue on issues of global concern.



Inauguration of Al-Quds University Joint Conference, Naples, Italy

INTERNET OF THINGS, CLOUD AND FOG PARADIGM: THE CATCH-UP

Babatunji Omoniwa *

Many are of the view that whatever new technology that is developed in the advanced North has immediate applicability in the South. Others believe it takes considerable amount of time for newer technologies to settle in. Looking back at the days of the traditional analog telephone systems and how far the North was from the South, one would have believed that the developing nations would still be stuck somewhere between the old telephony world and the present day smart-world, where smart devices dictate several daily decisions. Despite the obvious technological gap between the North and the South, countries in the South have risen to the challenge in terms of technology use, “the catch-up phenomenon”, as it is often called, thanks to the proliferation of smart mobile devices and availability of the “curse of next generation”, the social networks. Moreover, in today’s world, information cannot be caged, as global awareness is on the rise. The affordability of smart devices and cheaper access to internet bundles has made it possible for global inclusiveness.

From controlling home equipment and appliances from a remote location, to sophisticated, automated industrial processes, controlling the world around becomes a click of a button away. The internet has now become a global phenomenon, and is a part of daily lives of individuals around the globe. Over the last decade, the need to connect all things to the internet has been the focus of academia and industry. In fact, it is estimated that by 2020, over 50 billion things will be connected to the internet¹. This implies that the number of devices and things that will be connected will consequently out-number the persons living on earth. With these exploding statistics, several research publications have been made, as well as proposals of standards that will enable this emerging technology to become a reality. Unquestionably, the motivation for the Internet of Things (IoT) paradigm is the high impact it will have on several aspects of everyday life of end-users.

Popular paradigms like cloud computing, and fog/edge computing have also emerged. The cloud enables ubiquitous access to services and resources over the Internet. The key features in the cloud are its storage, computing and processing capabilities². Many questions have been posed as to who manages the cloud? Where and how is information

stored? Many of the questions raised may not have been comprehensively answered vis-à-vis issues of security and privacy of information. Despite unanswered queries, cloud computing – as a disruptive technology – has the potential of transforming markets, economies, and societies of any country. In this regard, developing countries are attractive markets for cloud services, and this technology has diverse applications in the areas of education, health, commerce, and business. However, there is still obscurity in the South to what this technology offers.

Cloud computing minimizes operational cost in terms of hardware, software and personnel. This is achieved by inherent services offered by the cloud, such as the Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS), and Software-as-a-Service (SaaS)³. This can be seen in Figure-1. All these services enable clients and end-users to benefit from the utility offered by the cloud. Recently, the concept of having smaller clouds called fogs, sometimes referred to as cloudlet, was introduced. The fog was introduced to reduce some of the perceived limitations of the cloud, such as delay in processing data, security concerns, slow computing, and decision making. Most of the limitations of the cloud boils down to its remote distance from end-users of smart devices and connected things, as most cloud data centers are located in the United States. Many are of the view that the explosion in the number of connected things will pose serious threats and degradation to existing cloud infrastructure.

The birth of fog computing enhanced IoT services in a number of ways. It is noteworthy that the fog computing does not replace cloud computing, however it complements it by playing an intermediary role. This entails performing a chunk of the task closer to where the data is produced. This task may involve requests / response to data and services. Thus, fog computing immensely reduces the burden on the cloud, by performing micro-cloud services in a highly distributed manner. The fog best suits applications requiring low latency, such as disaster alert, health care monitoring, real-time video streaming, domotics, and mobile / vehicular communication⁴. Another promising merit of fog computing is the way and manner it opens up room for small and medium scale enterprises (SMEs).

*** About the Author:** Babatunji Omoniwa works as Assistant Research Fellow at the National Mathematical Centre, Abuja – COMSATS’ Centre of Excellence in Nigeria. He is presently pursuing a PhD degree in Computer Engineering under The World Academy of Sciences (TWAS) fellowship programme. His PhD research is on the Internet of Things. He is also rendering research services at COMSATS Secretariat, Islamabad. In 2010, he was selected as Science with Africa (SWA) innovation finalist at the UNECA, Ethiopia, and RTI NC, USA. In 2011, he got selected as ICT research scholar in Nairobi, Kenya. He served as deputy leader of the Nigerian informatics team in Kazan, Russian Federation (2016) and Tehran, Iran (2017). He is a member of the Internet Society. **Email:** batatunji@comsats.org



During the last decade, SMEs have played lesser roles in the IoT paradigm, as multi-national IT giants like IBM, Google, Amazon, Microsoft, amongst others, have hijacked the stage as major investors in cloud computing. This is due to huge cost involved in setting up cloud data centers, maintaining super processing computers, and running the overall affairs of these centers. Fog computing makes it possible for SMEs to set-up and run micro data centers based on their financial strength. Ultimately, this will give opportunity to IT firms in the South to play key roles in fully actualizing the promising potentials of cloud computing and the IoT. The moment more IT firms key into this vision, more jobs will be created, thus enhancing the quality of life of citizens within nations of the South.

With fast growing population witnessed recently in the South, especially in Africa, it will become a tedious task in sustaining individuals and the environment. IoT plays a vital role in minimizing traffic congestions, crime control, water management, disaster management, minimizing energy consumed in smart homes, and even health-care monitoring. The 11th goal of the UN's Sustainable Development Goals (SDGs) ensures to "make cities and human settlements inclusive, safe, resilient and sustainable"⁵ and this can be achievable with IoT.

With this goal, it is imperative for governments in the South to look closely on how IoT can boost energy savings through smart grids, where energy wastage is minimized and controlled using energy load management systems. Also, ensuring safer cities through intelligent video surveillance solutions, GPS tracking of stolen vehicles, livestock monitoring through Radio Frequency Identification (RFID) tags, disaster control sensors to monitor and promptly notifying the control center to mitigate threats of any kind within a city. The list of benefits that could be derived from IoT are inexhaustible.

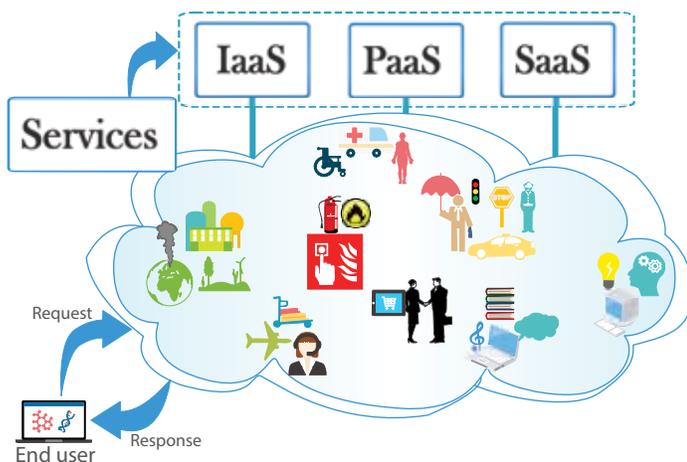


Figure-1: Cloud Paradigm and Services

In the South, we require key players in research and innovation for sustainable development. For example, COMSATS, has played its part in promoting the applications of IoT in various capacities, one of which is the tele-health programme dating back to 2001, which provided remote health services to some rural communities in tough terrains. CIIT, Islamabad, a flagship project of COMSATS, has recently implemented the smart campus, which makes learning and research more conducive. This and many more have been actualized on a micro scale. As such, there is need for more inclusiveness. Governments in the South must rise up to the challenge. This time, we need to look inwards, set benchmarks rather than play the catch-up.

In conclusion, like other novel innovations, countries in the South need to quickly and fully embrace the IoT paradigm, and support implementation of enabling technologies, the fog and cloud computing. However, this requires time and lots of investment. Policy makers also have a crucial role to play in analyzing the potentials of adopting IoT. Furthermore, through scientific/research activities, more effort can be put in place to increase North-South and South-South collaborations. This will go a long way in enhancing local content, thereby paving way for a smarter and self-sustaining society.

References:

1. J. Lin, W. Yu, N. Zhang, X. Yang, H. Zhang, and W. Zhao, "A Survey on Internet of Things: Architecture, Enabling Technologies, Security and Privacy, and Applications," *IEEE Internet of Things*, vol. 4, no. 5, pp. 1125-1142, Oct. 2017. doi: 10.1109/JIOT.2017.2683200.
2. L. Atzori, A. Iera, and G. Morabito, "The Internet of Things: A survey," *Computer Networks*, vol. 54, no. 15, pp. 2787-2805, Oct. 2010. doi: 10.1016/j.comnet.2010.05.010.
3. Z. Wen, R. Yang, P. Garraghan, T. Lin, J. Xu and M. Rovatsos, "Fog Orchestration for Internet of Things Services," *IEEE Internet Computing*, vol. 21, no. 2, pp. 16-24, Mar.-Apr. 2017. doi: 10.1109/MIC.2017.36
4. M. Chiang, and T. Zhang, "Fog and IoT: An Overview of Research Opportunities," *IEEE Internet of Things*, vol. 3, no. 6, pp. 854-864, Dec. 2016. doi: 10.1109/JIOT.2016.2584538
5. Sustainable Development Goal 11, The United Nations, in Ecuador from 17-20 October 2016, www.un.org/sustainabledevelopment/cities/

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Research for the Enhancement of Agriculture

A group of scientists has developed a mobile application, which uses artificial intelligence for diagnosis of crop diseases (*SciDev.Net*, 13th November 2017). This application is aimed to help African small farm-holders. The app uses a Google programme called TensorFlow that allows machines to train and learn. The app can be used for cassava brown streak disease and cassava mosaic disease. It could diagnose the disease accurately in the field and will send the mobile phone short message service alerts for the farmers in Africa. The project is also in phase of expansion to include banana, sweet potato and yam diseases.

For enhancing the agricultural produce, a home-made filter system has been designed, which uses layers of soil and gravel to clean domestic waste-water and make it suitable for irrigation (*SciDev.Net*, 8th November 2017). The tested filter prototype removed a large amount of waste including solid particles, organic pollution, nitrogen and fertilizer residue. The system also successfully killed coliform bacteria and other pathogens in water. The filter system consists of a two-stage process that can easily be assembled with local material in water barrels. The researchers created filter 'bricks' from sandy soil, charcoal, sawdust and iron scraps, and packed these into barrels with gravel. While running through each barrel, water is filtered alternatively by the bricks and the gravel. It also has benefits, such as simple maintenance, no frequent clogging and has no energy requirements.



Developments in Food Security and Bio-energy

The need for renewable production of biofuels and other commodity chemicals is increasing. Scientists have, therefore, been working to grow the internal organization of bacteria to improve its efficiency for making nutrients, pharmaceuticals and chemicals. Scientists from University of Kent have built a miniature scaffold inside a bacterium, which can be used to increase its cellular productivity leading to enhancement of next generation biofuel production (*Science Daily*, 11th December 2017). Nanotubes have been produced that can cause a scaffold inside the bacteria causing an increase in the efficiency of cellular production. By applying this technology to enzymes required for production of bio-ethanol, the ethanol production increased to over 200%.

Another study conducted in University of Edinburgh suggests that genes can be edited in algae to produce bigger amounts

of medicines and renewable fuels through it (*Science Daily*, 7th December 2017). This method can lead to environment-friendly and cheap ways for making the products to be used in cosmetics, plastics and food industries. The technique involves addition of DNA cutters and short pieces of DNA directly in to the algae, allowing the addition or modification of existing genes within the algae. Using this technique, efficiency of productions has been observed to improve by 500 folds, which can unleash the potential of global algae industry. The method could potentially also be used to engineer crops to increase yields, improve disease resistance or enable plants to thrive in harsh climates.

Regeneration of Biological Organs with 3D Printing

Researchers from Osaka University, Japan, have recently developed an enzyme-driven crosslinking method, which can be used to glue the droplets of biological ink to form complex 3-D organs. The method also enhanced the variety of cell types, which can be handled by ink jet bio-printing (*Science Daily*, 27th December 2017). The technology uses hydrogelation mediated by an enzyme – horseradish peroxidase – for creating the cross links between phenyl groups of added polymer in presence of oxidant hydrogen peroxidase. With this technology, regeneration of human body parts can become a reality. While human organ regeneration faces many challenges, this technology is highly versatile and can be worked on for better success rates.

A Smart Mechanical Part Engineered for Power Plants

A research has been conducted in Egypt to enhance the life of journal or plain bearing (a mechanical part, which supports heavy machinery and prevent friction, wear and tear, and erosion that affects the surface of rapidly rotating parts). Journal bearings also help to control movement of blades in machinery. They are used in many types of machinery, including cars, computers, refrigerators and construction equipment.



The scientists introduced a magnetic part that allows users to control the oil-filled bearing while operating the machinery, and this control can be done remotely, without human intervention (*SciDev.Net*, 2nd November 2017). This 'smart' bearing improves the performance of turbines in power plants that combine gas and steam technologies, and of traditional electricity generators.

PROFILE OF MEMBER COMSATS' TECHNICAL ADVISORY COMMITTEE

PROF. DR. YIN LI, INSTITUTE OF MICROBIOLOGY, CHINESE ACADEMY OF SCIENCES, CHINA

Prof. Dr. Yin Li is a member of COMSATS' Technical Advisory Committee that was reconstituted as an outcome of the 20th Coordinating Council Meeting held in National Research Center (NRC), Cairo, Egypt. Currently Prof. Li is the Director of CAS-TWAS Center of Excellence for Biotechnology (CoEBio). He is also the Founding Director of the Key Laboratory of Systems Microbial Biotechnology affiliated with Tianjin Institute of Information Biotechnology (TIB, CAS); and the Key Laboratory of Microbial, Physiological and Metabolic Engineering affiliated with Institute of Microbiology (IM) of Chinese Academy of Sciences.



Prof. Li completed his PhD degree in Fermentation Engineering at Jiangnan University, China, in 2000. There on, he joined Wageningen Centre for Food Sciences, Netherlands, as Post-Doctoral Researcher. Soon after, he started working as a Research Officer at the University College Cork, Ireland. In 2006, he was appointed as Principle Investigator and Professor by the IM, CAS, under the support of Hundred Talents Programme of CAS. From 2013 to 2014, his appointment as Tang Cornell-China Scholar and work at Cornell University as Visiting Professor furthered his research and academic pursuits. During 2015-2017, he was the Deputy Director-General TIB, CAS.

During his research career, Prof. Li has performed research in molecular physiology and metabolic engineering of industrial microbes for sustainable and efficient production of bio-based chemicals. He and his colleagues have developed efficient genetic/genomic manipulation tools for several industrial microbial strains, and pioneered in engineering microbial strains capable of producing bio-based chemicals from renewable biomass and greenhouse gases. His research group is actively collaborating with multinational enterprises, including Shell in UK, DSM in the Netherlands, Nestlé in Switzerland, and a dozen of domestic enterprises.

Prof. Li has been the project co-PI of China's first synthetic biology major project "SynCell" funded by the National Basic Research Programme of China (973 program), and he is now coordinating a "Genome Engineering" major project funded by National High Technology Program of China (863 program). Prof. Li served as external reviewer for European Science Foundation, Israel Science Foundation, French National Research Agency, European Transnational Funding and Research Initiative, Research Council of Norway.

Prof. Li has been very active in supporting TWAS (The World Academy of Sciences, for the advancement of science in developing countries) activities. In 2010, he was selected as Young Affiliate of TWAS. In 2012, he was awarded the TWAS Regional Prize for Building Scientific Institutions.

Under Prof. Li's leadership, CoEBio has developed a website, "Biotechnology in Developing Countries" (www.cas-twas-coebio.org/list/1.html), which is dedicated to building up a biotechnology information network among the developing countries. Prof. Li proposed and initiated a new TWAS initiative: TWAS Young Affiliates Network (TYAN). He is now serving as the founding chair of the TYAN Executive Committee. His efforts in supporting and promoting TWAS activities have been well recognized and appreciated by the Academy.

Besides these achievements, Prof. Li has also served/ is serving as:

- Director, Center for Bioenergy and Industrial Biotechnology, Institute of Microbiology, Chinese Academy of Sciences (2007 - 2008);
- Deputy Director-General, Tianjin Industrial Biotechnology R&D Center, Chinese Academy of Sciences (2008 - 2009);
- Adjunct Professor, University of Science and Technology of China (2008 – till date);
- Adjunct Professor, Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences (2010 – till date);
- Chair of the Scientific Advisory Board, Tianjin Institute of Industrial Biotechnology, CAS (2010 – till date); and
- Vice President, Beijing Society of Microbiology (2012 – 2017).

Prof. Li along with his colleagues, has filed more than 40 Chinese patents and published more than 120 original papers/reviews/perspectives in peer-review international journals, which include 'Science', 'PNAS', 'Current Opinion in Biotechnology', 'Trends in Biotechnology', 'Trends in Microbiology', 'Biotechnology for Biofuels', 'Metabolic Engineering', 'Biotechnology & Bioengineering', and 'Applied & Environmental Microbiology', with over 3,100 citations, and an H index of 32. He also serves as editor, research editor, member of the editorial board of several international academic journals including Microbiology, Microbial Cell Factories, Biotechnology Journal, Industrial Biotechnology, and Food Bioscience.

Prof. Li is also a member of the publishing committee of the Microbiology Society of UK. He is an Advisory Board Member of the Publishing Committee of Microbiology Society.

Contact details:

Prof. Dr. Yin Li
Institute of Microbiology
Chinese Academy of Sciences (CAS)
No. 1 West Beichen Road
Beijing 100101, China.
Email: yli@im.ac.cn

COMSATS' BRIEF AND ANNOUNCEMENTS

Selected Forthcoming Scientific Events in COMSATS' Countries

- 24-27 April 2018 ICGEB Young Scientist Travel Awards – 3rd Protein Biophysics at the End of the World, Santiago, Chile
(<https://goo.gl/9i81F5>)
- 04-06 May 2018 7th International Conference on Software and Information Engineering (ICSIE 2018), Cairo, Egypt
(www.icsie.org)
- 18-21 May 2018 The 5th International Conference on Manufacturing and Industrial Technologies (ICMIT 2018), Hefei, China
(www.icmit.org/)

21st Meeting of COMSATS Coordinating Council (3-4 April 2018) and 3rd Meeting of Technical Advisory Committee (5 April 2018) Almaty, Kazakhstan

COMSATS is pleased to announce the convening of 21st meeting of its Coordinating Council and the 3rd meeting of Technical Advisory Committee, in Almaty, Kazakhstan, on 3-4 April 2018 and 5th April 2018, respectively, to be hosted by COMSATS' Centre of Excellence, Al Farabi Kazakh National University (KazNU), Kazakhstan. The Council would review the activities of COMSATS' Network since its last meeting, follow up on the decisions and recommendations made in the previous meeting, and outline the future course of action. The TAC meeting would deliberate on matters affecting technical programmes and international collaborations of COMSATS with a special focus on improving the efficacy of COMSATS' Network. For more information on the meetings, the members or their representatives may contact Mr. Tajammul Hussain over email (tajammul@comsats.org) or Mr. Farhan Ansari (farhan@comsats.org)

Scholarships offered by COMSATS' Centres of Excellence

Students from COMSATS' Member States are welcome to benefit from the following offers from COMSATS Centres of Excellence:

- Hundred scholarships for students/researchers for postgraduate studies and ten scholarships for post-doctoral fellowships at all campuses of COMSATS Institute of Information Technology (CIIT), Pakistan.
- Seven Ph.D scholarships [4 fully paid and 3 partially paid (50%)] and five-postdoctoral fellowships at the Iranian Research Organization for Science and Technology (IROST), Iran.
- Ten doctoral scholarships/post-doctoral fellowships at the International Center for Chemical and Biological Science (ICCBS), Pakistan.
- Five post-doctoral fellowships at the National Research Centre (NRC), Egypt, and International Centre for Climate and Environment Sciences (ICCES), China, each.
- One post-doctoral fellowship at Bangladesh Council for Scientific and Industrial Research (BCSIR), Bangladesh.

Contact for more information: Mr. Tajammul Hussain, Advisor-Programmes (tajammul@comsats.org)

A BRIEF ON COMSATS

The Commission on Science and Technology for Sustainable Development in the South (COMSATS) is an intergovernmental organization, with its Secretariat located in Islamabad, Pakistan.

COMSATS, currently, has 26 developing countries as its members, spread across three continents, i.e., Latin America, Africa and Asia. A network, of 21 International S&T Centres of Excellence, is also affiliated with COMSATS to contribute to scientific development of its Member States. The mission of COMSATS is to help create a world where all nations are at peace with one another and capable of providing good quality of life to their populations in a sustainable way using modern S&T resources. For detailed information, please visit COMSATS' website: www.comsats.org.

COMSATS NETWORK

 BCSIR-Bangladesh www.bcsir.gov.bd	 ICENS-Jamaica www.icens.org	 UCAD-Senegal www.ucad.sn
 Embrapa Agro-biologia-Brazil embrapa.br/grobiologia	 RSS-Jordan www.rss.jo	 ITI-Sri Lanka www.iti.lk
 ICCES-China english.icces.ac.cn	 KazNU-Kazakhstan www.kaznu.kz/en/	 IRCC-Sudan www.ircc.gov.sd
 CIF-Colombia www.cif.org.co	 NMC-Nigeria www.nmcabuja.org	 HIAST-Syria www.hiast.edu.sy
 NRC-Egypt www.nrc.sci.eg	 ICCBS-Pakistan www.iccs.edu	 TIRDO-Tanzania www.tirido.org
 CSIR-Ghana www.csir.org.gh	 CIIT-Pakistan www.ciit.edu.pk	 CERTe-Tunisia www.certe.nrnt.tn
 IROST-Iran www.irost.org	 AQU-Palestine www.alquds.edu/en	 TÜBITAK MAM-Turkey www.mam.gov.tr