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Distinguished Guests of the dinner hosted by Pakistan's Federal Minister for Science and Technology (Page 2)

Inside this Issue

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From the Executive Director's Desk

The biggest cooperative ventures in the history of the civilized world have had one thing in common; a collective consciousness focused on resolving identified issues. That is to say that consensus on common goals is a very strong driving force when it comes to achieving something otherwise beyond the capacity of individuals or smaller groups.

The greatest international enterprises of today were realized from a common thought that took abode in the minds of many persons, institutions and nations. Thus transpired a number of international collaborations in various fields, i.e., social, political, economic, and scientific, serving the interests of many. Major organizations of the North, such as United Nations, European Union, CERN, and others are a result of identification of a common agenda for relevant stakeholders. The South also has a number of such organizations established based on commonality of interests and desired goals, COMSATS, TWAS, South Centre, NAM S&T Centre, are just to name a few.

The organizations of the South need to remain even more dynamic in their pursuits, owing to the fast changing socio-economic conditions of the developing world. My counterpart from The World Academy of Sciences (TWAS) aptly pointed out one such challenge. "When thousands of people, including many researchers, leave their home countries (in the South), the exodus perpetuates instability in those countries and damages prospects for future development."[*)] The global and regional conflicts not only prolong the South's efforts against low development standings, but also undo decades of prosperity further adding to the disparity between the North and the South.

COMSATS is conscious of the complexity of the challenges involved in achieving the objective of S&T-led sustainable development for its Member States, and has embarked on due process of consultations as to how to make the organization's pursuits more practical, and efforts more effective, with a longer lasting impact. Meetings with stakeholders and experts are, therefore, hoped to help better steer the organization in the right direction.

The pages of this newsletter provide a glance at the organization's engagements during the reporting period and are open to readers for feedback.

[*)] Hassan, M. H. A. (2017). Migration—the choices we face. *Science*, 356(6339):667, DOI: 10.1126/science.aan5965

NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

COMSATS' Focal Ministry in Pakistan hosts a Dinner to Honor the New Executive Director COMSATS

On March 15, 2017, the Federal Minister for Science and Technology, Government of Pakistan, H.E. Rana Tanveer Hussain, hosted a dinner to introduce the newly appointed Executive Director COMSATS to the diplomatic community of COMSATS Member States and a few non-members in Islamabad, as well as senior government functionaries of Pakistan. The dinner had an impressive attendance of 75, including ambassadors and representatives from 22 foreign missions in Islamabad. The foreign missions from COMSATS' Member States present on the occasion belonged to Bangladesh, China, Egypt, Iran, Kazakhstan, Morocco, Nigeria, Palestine, Sri Lanka, Sudan, Syria, and Tunisia, while those from non-member states belonged to Afghanistan, Azerbaijan, Brunei, Mauritius, Oman, Tajikistan, Thailand, Turkmenistan, Turkey, and Uzbekistan. Senior officials, inter alia, from Pakistani Ministries of S&T, Foreign Affairs, and Planning and Development; COMSATS Secretariat, COMSATS Institute of Information Technology, and COMSATS Internet Services also attended the dinner.

Speaking to the august gathering at the dinner, His Excellency congratulated Dr. S.M. Junaid Zaidi on assuming charge as Executive Director COMSATS, which he deemed "a befitting recognition of Dr. Zaidi's dedicated and selfless services spanning well over 45 years". He also communicated to Dr. Zaidi felicitations from the Prime Minister of Pakistan, who approved the appointment last month.

Earlier, the Federal Secretary, Ministry of Science and Technology, Mr. Fazal Abbas Maken, showed his confidence in the new incumbent having a vast experience of civil service, education sector, S&T policy and diplomacy. He considered it important to support COMSATS in furthering the process of South-South multilateral cooperation in addition to Pakistan's bilateral cooperation with some of the countries represented at the dinner.

H.E. Rana Tanveer Hussain addressing the guests of the dinner hosted in honour of Dr. Zaidi

In his remarks on the occasion, the Executive Director COMSATS expressed his gratitude to the Minister for honoring him by hosting the dinner. He was grateful to the Prime Minister for appointing him as the Executive Director, and expressed gratitude to the Federal Minister and Federal Secretary, Ministry of Science and Technology, for the confidence they showed in him. He held in high regard the efforts of his predecessors.

In his vote of thanks after the dinner, Mr. Rana Tanveer considered the support of the foreign missions in the country crucial for COMSATS' smooth operations. He reiterated his Ministry's strong resolve to stand by COMSATS to help achieve its goals.

Newly inducted batch of foreign interns receiving a briefing

COMSATS Inducts a Batch of Internees from Developing Countries

A group of 10 students from 7 developing countries, Bangladesh, Cameroon, Ethiopia, Gambia, Iran, Nepal and Nigeria, has been inducted as interns in Pakistan. The group received an orientation on 14th March 2017 at COMSATS Secretariat in Islamabad. These students are enrolled in Ph.D (Biosciences and Mathematics); M.S. (Biochemistry & Molecular Biology and Mathematics); B.S. (Management Sciences, and Telecom Engineering), and post-doctoral fellowships in the fields of bio-sciences and physics. The students from four Member States are availing graduate and post-graduate scholarships offered by CIIT.

The group was received at COMSATS Secretariat by Dr.

Abdul Aziz Khan, Advisor CIIT. They were introduced to COMSATS as a high-level forum of developing countries striving for their socio-economic uplift through cooperation and collaboration in S&T. The Executive Director COMSATS, Dr. S. M. Junaid Zaidi, also graced the briefing session with his presence. He presented the organization as an agent and facilitator of cooperation among the developing countries.

Speaking on the occasion, Dr. Abdul Aziz Khan opined that the students' association with COMSATS will add to their credentials and that the same would complement their academic pursuits, with due importance given to their studies. Underscoring the scope and mandate of COMSATS, he believed that the students would best utilize their time at COMSATS Secretariat to help identify their countries' priorities and problem areas for more focused collaboration among them.

Participants of 25th Advanced Diplomatic Course visit COMSATS Secretariat

A group of six mid-career diplomats from the COMSATS' Member Countries visited COMSATS Secretariat, Islamabad on invitation from Dr. S. M. Junaid Zaidi, Executive Director COMSATS on 16th March 2017. These diplomats were receiving training at 25th Advanced Diplomatic Training Course organized by the Foreign Services Academy, Ministry of Foreign Affairs, Government of Pakistan. The Group comprised of Mr. Idrees Yaqub and Mr. Bin Yameen Yahya Tanko, Deputy Directors, Ministry of Foreign Affairs (Ghana); Mr. Achach Abdellah, Secretary, Ministry of Foreign Affairs (Morocco); Mr. Joseph Alto Ahois Kapuiga, Foreign Services Officer, Ministry of Foreign Affairs (Tanzania); Mr. Christy Ruban Augustin, Deputy Director, Ministry of Foreign Affairs (Sri Lanka); and Mr. Tickakunde E. M. Mutseyekwa, Deputy Director, Ministry of Foreign Affairs (Zimbabwe).

These foreign trainees had an informal discussion with the senior officials of COMSATS Secretariat that included the Executive Director COMSATS; Mr. Tajammul Hussain, Advisor (Programmes) COMSATS; Mr. Bilal Chouhan, Director (A&E) COMSATS; Ambassador Fauzia Nasreen; and Dr. Arshad. S. Malik, Advisor, International Office of the COMSATS Institute of Information Technology (CIIT).

Speaking to the foreign guests, Dr. Zaidi considered the role of diplomatic community of these countries essential for sensitizing the political leadership in their respective countries towards multilateral cooperation for sustainable development particularly in Science and Technology.

Brainstorming Session on Way Forward for COMSATS

The Executive Director COMSATS, hosted hi-tea for senior scientists and experts from different institutions related to science and technology on 29th March 2017. The purpose of the informal sitting was to brief the experts regarding different on-going activities of the COMSATS and to invite their inputs on COMSATS' projects and programmes.

The hi-tea had a participation of some renowned scientists of Pakistan, including Dr. Yousaf Zafar, Chairman Pakistan Agriculture Research Council (PARC), Prof. Dr. Anwar-ul-Hassan Gilani, Chairman Pakistan Council for Science and Technology (PCST), Dr. Muhammad Ashraf, Chairman Pakistan Council of Research in Water Resources (PCRWR), Dr. Zabta Khan Shinwari, President Pakistan

COMSATS' officials with foreign participants of the 25th Diplomatic Advanced Course

Academy of Sciences and Dr. Aslam Baig, Distinguished Scientist from National Centre for Physics. Mr. Tajammal Hussain, Advisor Programmes, Mr. Bilal Chouhan, Director Administration and Establishment, Mr. Nisar Ahmad, Deputy Director (Systems), and Mr. Akif Sattar, Coordination Officer, from COMSATS Secretariat were also present on the occasion.

Among the ideas shared during the discussions was having international projects like SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East) to be emulated in Pakistan to facilitate the scientists of Member States. Similarly, it was suggested that COMSATS, in collaboration with international organizations like UNESCO, can help develop international R&D collaborations on the lines of CERN (European Organization for Nuclear Research). Focus areas for future activities of COMSATS agreed on by the senior participants included, Health, Food Security, Water Resource Management, Climate Change and Nanotechnology. It was also suggested that COMSATS can also help develop an advanced center of Nanotechnology for multi-disciplinary research in the field in one of the Member States.

Brazilian Ambassador Delivers a Lecture at COMSATS Secretariat

His Excellency Claudio Raja Gabaglia Lins, Ambassador of Brazil in Islamabad, visited COMSATS Secretariat, on April 12, 2017. The Ambassador was received by the Executive Director COMSATS, Dr. S.M. Junaid Zaidi, and senior officials of COMSATS. During this good will visit, H.E. Mr. Lins also delivered a lecture on 'Pak-Brazil Relations' that was attended by officials of COMSATS Secretariat, and CIIT.

In his opening remarks before the lecture, Dr. Zaidi welcomed the honorable ambassador and noted the excellent relations of COMSATS with its Brazilian Centres of Excellence, Embrapa Agrobiologia. Based on this experience, he showed his desire to have more of similar synergies in the South and the North. He underscored the social and cultural strengths of Brazil and also noted the country's contribution to Science and Technology.

In the wake of the growing agro-business of Brazil, the Ambassador shared the growing concerns of environmental protection, as he considered it Brazil's duty to protect environment, especially the Amazon. Brazil, he noted is in transition, politically and economically, owing to its fight against corruption and recovery from recession. He considered both as positive indicators for Brazil, complemented by good performance by Brazilian institutions, being spearheaded by new generation.

The Brazilian Ambassador delivering his lecture

He noted that Brazil is the 9th largest economy in the World and has highest GDP in Latin America. He informed that EMBRAPA is undertaking very interesting work of both practical and theoretical significance. Research at its Agrobiology centre, he further informed, is helping to increase agricultural productivity, as well as research capacity of Brazilian scientists in related fields. The sustainable agriculture research made Brazil the largest producer of coffee, soya bean, sugarcane and oranges.

The Brazilian Ambassador informed that his country's R&D has gained a lot of prominence internationally during the last few decades. Sharing some statistics, in this regard, he apprised that Brazil has 2,300 higher education institutions, produced 16,700 Ph.D and Brazilian scientists published 40,500 papers during 2016.

At the end of his informative presentation, the Ambassador responded to a number of questions from the audience that related to BRICS block, education sector of Brazil, cultural and academic exchanges, and common socio-political.

Distinguished Visitors at COMSATS Secretariat

- H.E. Walid Abu Ali, Ambassador of State of Palestine to Pakistan, March 27, 2017
- Mr. Fazal Abbas Maken, the Federal Secretary Ministry of Science and Technology, Pakistan, March 28, 2017
- H.E. Mr. Radwan Loutfi, Ambassador of the Syrian Arab Republic to Pakistan, April 3, 2017
- Mr. Pervaiz Butt, the Founding Executive Director of COMSATS, April 11, 2017
- Honorable Member National Assembly, Mrs. Tahmina Daultana, April 21, 2017

SPECIAL SECTION: 3RD INTERNATIONAL CONFERENCE ON AGRICULTURE, FOOD SECURITY AND BIOTECHNOLOGY, ISLAMABAD

The 3rd International Conference on Agriculture, Food Security and Biotechnology was jointly organized by COMSATS, ISESCO and Pakistan Agricultural Research Council (PARC), from 26th to 27th April 2017 at National Agricultural Research Centre (NARC), Islamabad, Pakistan. NARC is the largest research centre of the Pakistan Agricultural Research Council (PARC).

The event was organized under the biennial cooperation agreement 2016-2017 between COMSATS and ISESCO. Recent developments and emerging trends in food security based on technical and scientific inputs from relevant subject experts were shared and discussed during the conference.

The three-day Conference comprised of a total of 7 sessions including inauguration, 5 technical sessions and a concluding session. The five technical sessions constituted 32 talks and presentations and poster presentation contest. The resource persons of the conference, included guests from Egypt, Turkey, Tunisia, Sudan, Iran, Sri Lanka, and Uzbekistan, made technical presentations on variety of topics relating to the theme of the event.

Inauguration

The Conference was inaugurated by the Federal Minister for Food Security and Research, Pakistan, H. E. Mr. Sikandar Hayat Khan Bosan, on 26th April 2017 at National Agricultural Research Center, Islamabad, Pakistan. The inaugural session was attended by 130 participants from different backgrounds, including academicians, students, scientists, media personnel and researchers.

H.E. Mr. Sikander Hayat Khan Bosan addressing the audience of the inaugural ceremony

Speaking on the occasion, Dr. Ghulam Muhammad Ali, Member Coordination and Monitoring/ Sr. Director NIGAB, Pakistan Agriculture Research Council (PARC), welcomed the participants and guests of the inaugural session and considered it important to take measures towards food security and safety through effective use of science and technology. He considered the event a platform for fostering research linkages, scientific collaborations and capacity building.

In the keynote speech titled 'Role of Biotechnology in Agriculture for Food Security', delivered by Professor Dr. Kauser A. Malik, Department of Biological Sciences, FC College Lahore, Pakistan, opined that it is the fear of unknown that keeps the human beings away from adopting the new technologies and advocated the use of genetically modified crops to address hunger and malnutrition. He asserted that the GM foods are no more harmful to the environment and biodiversity than commercial agriculture. He appreciated that organizations like ISESCO and COMSATS were taking keen interest in agricultural biotechnology.

The Executive Director COMSATS, Dr. S. M. Junaid Zaidi, in his message noted the strong influence of biotechnology on food production and agriculture is undeniable, especially for countries like Pakistan with fertile lands and good weather conditions. He encouraged scientists, farmers and extension specialists to come forward and create a regular forum meant to discuss issues related to theme of the Conference. Dr. Abdulaziz Othman Altwaijri, Director General ISESCO, in his message stressed that the world is facing multiple challenges in achieving food sustainably while conserving natural resources.

Dr. Yusuf Zafar, Chairman PARC, in his inaugural address opined that for achieving productivity as well as sustainability of agricultural systems, it is crucial to be up-to-date about new technologies that might have potential to change production and consumption concepts, standards and paradigms.

The Chief Guest Federal Minister for Food Security and Research, Pakistan, His Excellency Mr. Sikandar Hayat Khan Bosan stressed upon the need to encourage and support smart agricultural practices. His Excellency assured full support of his Ministry towards initiatives for sustainable food production and food security.

Speakers from Uzbekistan, Turkey and Sri Lanka presenting their work during the technical sessions

International Speakers

- Dr. Shadman Namazov, Ministry of Agriculture and Water Resources, Uzbekistan
- Dr. Zihni Demirbag, Karadeniz Technical University, Turkey
- Dr. Mohsen Vaez, Iranian Research Organization for Science and Technology, Iran
- Dr. Radhika Samarasekara, Industrial Technology Institute, Sri Lanka
- Dr. Ghazi H. Badawi, University of Khartoum, Sudan
- Dr. Majid Javanmard, Iranian Research Organization for Science and Technology, Iran
- Dr. Mazahib Adam, Industrial Research and Consultancy Center (IRCC), Sudan
- Dr. Manal Eid, Suez Canal University, Egypt
- Dr. Hanen Falleh, Biotechnology Centre of Borj Cédria (CBBC), Tunisia

Technical Deliberations

The deliberations of the 2-day conference were spread over five technical sessions and a parallel poster contest, covering issues, research and findings related to:

- genome sequencing methods;
- marker-assisted breeding for crop improvement;
- microbial bio-pesticides and bio-stimulants;
- antimicrobial treatment for food safety;
- bio-products in plant protection;
- technologies of the agro-food products processing;
- environmental risk assessment of transgenic plants;
- impact of development of agricultural biotechnology research on food and economic security.

The technical sessions of the conference covered a total of 32 lectures on multi-sectoral approach, encompassing the crop, livestock, forestry and fishery sectors, as well as the use of microorganisms in these sectors.

The conference also underscored the importance of agricultural biotechnologies for achieving Sustainable Development Goals related to hunger and nutrition.

A few distinguished local speakers from the event included Dr. Zabta Khan Shinwari, Quaid-i-Azam University (Islamabad); Dr. Johar Ali, PARC (Islamabad); Dr. Tayyab Hasnain, Centre of Excellence in Molecular Biology (Lahore); Dr. S. M. Saqlain Naqvi, PMAS Arid Agriculture University (Rawalpindi); and Dr. Aftab Bashir Forman Christian College (Lahore).

Presentations were made on research initiatives by scientists from various academic and research organizations in Pakistan including the COMSATS Institute of Information Technology (CIIT), Islamabad; National Institute for Genomics and Advanced Biotechnology (NIGAB), Islamabad; Centre of Agricultural Biochemistry and Biotechnology (CABB), Faisalabad; University of Gujrat; National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad; Punjab University, Lahore; Institute for Biotechnology and Genetic Engineering (IBGE), Peshawar; Agricultural Biotechnology research Institute (ABRI), Faisalabad; Institute of Biomedical And Genetic Engineering, Islamabad; and Centre for Agriculture and Bioscience International (Rawalpindi).

The 35 posters covering a wide range of subjects in agricultural biotechnology were displayed throughout the event. Relevant Universities, R&D institutions and industries participated in the poster contest.

Participants of the Conference at the Poster Contest held on the sidelines of the event

Guests at the dinner hosted by the Executive Director COMSATS

A participant receiving a certificate from Chairman PARC, Dr. Yusuf Zafar

Dinner

To honor the international speakers and participants, a dinner was hosted by the Executive Director COMSATS, Dr. S. M. Junaid Zaidi, on 26th April 2017. The dinner was attended by a total of 110 including local and international participants and organizers of the conference. Officials from the Ministry of Foreign Affairs, and Ministry of Science and Technology, Pakistan, also attended the dinner.

Speaking at the dinner, the Executive Director COMSATS noted that scientists in Pakistan are doing excellent research work that needs to be promoted and commercialized. He suggested that COMSATS Institute of Information Technology (CIIT), a flagship project of COMSATS, should join hands with National Agriculture Research Center (NARC) for collaborative work aimed towards betterment of science, agriculture and society.

Dr. Yusuf Zafar, Chairman PARC, mentioned that this year Pakistan produced surplus wheat, potato, sugarcane, and corn. The yield, he noted, was the highest in 70 years that was possible only due to knowledge-based information sharing to the farmers.

Concluding Ceremony

The prizes for three best posters, based on novelty and potential for practical applications, were handed out during the concluding session on 27th April 2017.

The Conference was concluded on April 27, 2017, with closing remarks and vote of thanks by the co-organizers of the event, Dr. Yusuf Zafar (PARC) and Mr. Tajammul Hussain (COMSATS). The international speakers, Dr. Zihni Demirbag, Karadeniz Technical University (Turkey), and Dr. Majid Javanmard Dakheli, Iranian Research Organization for Science and Technology (Iran) also spoke at the concluding session.

Certificates were also distributed among the participants.

S&T INDICATORS OF A MEMBER STATE

In Spectrum: The Republic of the Gambia

The Republic of the Gambia is a West African country entirely surrounded by Senegal except at the western end, which is surrounded by North Atlantic Ocean giving it a 60 km coastline. The Gambia is known to be the smallest country in mainland Africa with a total area of 11,300 square kilometer. The Gambia River flows through the country and joins the Atlantic Ocean. Banjul is the capital city of the Gambia. The largest cities of the country are Serekunda and Brikama. The Gambia has a tropical climate, normally cooler season predominates the region. However, the season is hot and rainy from June to November (CIA World Factbook, 2017).

The Gambia gained independence in 1965 from United Kingdom under the leadership of Dawda Jawara. The current premier of the country is H.E. Mr. Adama Barrow, who became the third President of the Gambia in January 2017. The President of the country acts as both the Chief of State and Head of the Government. The official language largely spoken in The Gambia is English. The Gambia is one of the only two countries whose self-standing short name for official use should begin with the word "The" (CIA World Factbook 2017). Since The Gambia is the smallest country on mainland Africa, its culture is a product of diverse influences.

The Gambia is divided into eight local government areas, which include the national capital, Banjul which is classified as a city. The divisions of the country were created by Independent Electoral Commission in accordance with the National Constitution.

The Gambia has a population of 2,009,648 as of July 2016, making it the 147th most populous country of the world. With 177 people per square kilometer, The Gambia is one of the most densely populated countries in Africa. Most of the population (57%) is concentrated around urban and peri-urban centers. Almost 60% of the population of the country is under the age of 25. The annual population growth rate of the Gambia is 2.11%. The largest segment of the country's population (37.88%) is under the age 14 followed by population segment (33.92%) of ages between 25 to 54. About 95.7% of the overall population of the country is Muslim.

According to the Human Development Index, The Gambia ranks at 173 out of 188 countries with HDI value of 0.452 (UNDP Human Development Report, 2016). Between 1990 and 2015, The Gambia's HDI value increased from 0.330 to 0.452 (an increase of 36.8 percent). Table-A indicates The Gambia's progress on each of the HDI indicators. Between 1990 and 2015, The Gambia's life expectancy at birth increased by 8.4 years, mean years of schooling increased by 2.1 years and expected years of schooling increased by 3.8 years. The Gambia's Gross National Income per capita increased by about 11.4 percent from 1990 to 2015.

Table-A: The Gambia HDI Trends Based on Consistent Time Series Data and New Goalposts

	Life Expectancy at Birth	Expected Years of Schooling	Mean Years of Schooling	GNI per Capita (2011 PPP$)	HDI Value
1990	52.1	5.1	1.2	1,383	0.33
1995	53.4	5.4	1.8	1,414	0.351
2000	55.5	6.7	2	1,498	0.384
2005	57.9	8.1	2.4	1,468	0.415
2010	59.3	8.7	2.8	1,641	0.441
2011	59.5	8.8	2.9	1,506	0.44
2012	59.8	8.9	3.1	1,538	0.445
2013	60	8.9	3.2	1,553	0.449
2014	60.2	8.9	3.3	1,517	0.45
2015	60.5	8.9	3.3	1,541	0.452

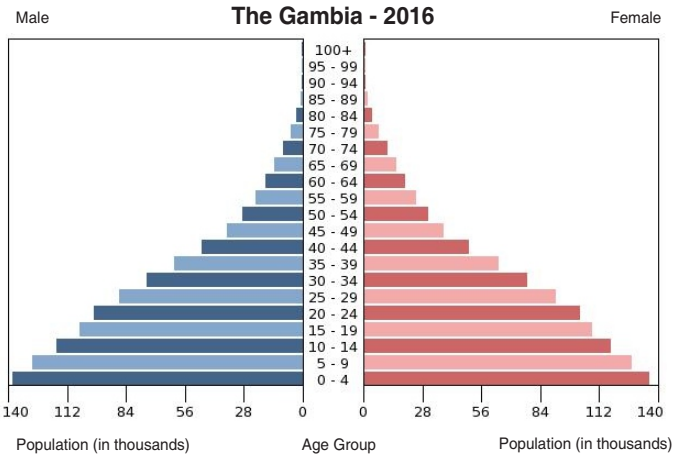
In 2011, the Research and Development Expenditure in The Gambia was 0.13221% in 2013. The reported expenditure on education in The Gambia is 10.276% (World Bank, 2016). The adult literacy rate in 2015 was 54.388%. The first university in the country, the University of The Gambia was established in 1999. Before that, the students aiming to get higher education had to travel to foreign countries to achieve their goals. As of 2015, 17.1% of The Gambian population was Internet users. The Internet penetration in the country is very low. The unemployment rate in the country is 29.8%.

The Gambia relies primarily on agriculture, remittances, and tourism to support its economy. Trade is important for the economy of The Gambia. The value of exports and imports equals 58 percent of the country's GDP. The investors, including foreign and domestic, are treated equally under the law. The Capital markets of the country consist only of the government securities and there is no system of stock exchange. The official currency of the country is Dalasi.

Almost 75% of the labor force is involved in agriculture which accounts for 23% of the GDP. The country's agriculture is based on groundnut production (5.3% of GDP), livestock (4.4 % of GDP), fishing (1.8% of GDP), and forestry (0.5% of GDP). The Gambian industrial sector contributes 12% in the total GDP out of which 50% is from manufacturing industry. The Gambia is manufacturer of soap, clothing and soft drinks.

The country is home to a beautiful biodiversity of the avian fauna making it a tourist attraction. Among all the African destinations, the European birders visit The Gambia because of its scenic beauties and birds. However, the country has just one airport for all its visitors.

Exports of The Gambia constitute groundnuts and their products, palm kernels, fish, and cotton lint. The country is in trading relationships with economic giants like Benelux, Japan, United Kingdom, Hong Kong, France, Spain, Netherlands, Ivory Coast, France, Senegal, and Belgium. Primary imports of the country include food products, transport equipment, manufacturers, machinery equipment, and fuel.



Source: The World Factbook 2016

Established in 2007, the Ministry of Higher Education, Research, Science and Technology (MoHERST) is the executive department for the coordination of science, technology, research and development related projects of the government of The Gambia. Since its inception, the Ministry is involved in working to provide the Gambian population with relevant and high quality education. Other mandates of the Ministry pertain to: making science and technology the growth engine of the country, ensuring gender equity in education sector, promoting innovation and research in science and technology, and ensuring sustainable environmental growth. H.E. Prof. Dr. Badara Joof is the Minister for Higher Education, Research, Science and Technology (MHERST), The Gambia, and also the national focal point of COMSATS in the country.

Given the immense challenges of development, The Gambia needs to improvise a national development strategy allocating more resources to science-led socio economic uplift of the people.

Key Development Indicators of The Gambia

Development Indicator	1990	2000	2010	2015
Population, total (millions)	0.92	1.23	1.69	1.99
Population growth (annual %)	4	3	3.2	3.2
Urban Population Growth (annual %)	6.8	4.9	4.6	4.2
Agriculture, value added (% of GDP)	..	..	32	21
Industry, value added (% of GDP)	..	..	14	15
Services, etc., value added (% of GDP)	..	..	55	64
Exports of goods and services (% of GDP)	60	26	24	22
Individuals using the Internet (% of population)	0	0.9	9.2	17.1
Mobile cellular subscriptions (per 100 people)	0	0.5	88	137.8
High-technology exports (% of manufactured exports)	..	0	1	0
Merchandise trade (% of GDP)	69	26	37	55

Source: *World Bank Indicators, 2016*

ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

CIIT, Pakistan, holds 100th Convocation

COMSATS Institute of Information Technology (CIIT) held its centennial Convocation in Islamabad on 20th March 2017, awarding 824 degrees in various disciplines. These included eight PhD degrees in Electrical Engineering, Mathematics and Computer Sciences, and 191 M.S. degrees in Bioinformatics, Physics, Economics, Biosciences, Business Administration, Computer Engineering, Electrical/Telecommunication Engineering, Electronics, Mathematics and Architecture.

Dr. S. M. Junaid Zaidi, Founding Rector CIIT and Executive Director COMSATS, awarded the students with medals and degrees as the Chief Guest of the event. Speaking on the occasion, Dr. Zaidi appreciated the efforts, dedication and team-work of CIIT faculty and administration and noted that the Institute provides best opportunities for learning and personality development in a supportive environment.

A highlight of the Convocation was the transfer of interim charge of Rector by Board of Governors CIIT from Dr. S. M. Junaid Zaidi to Prof. Dr. Raheel Qamar. The new Rector presented this year's Institute Report. Addressing the audience, Dr. Qamar noted the great efforts of Dr. Zaidi for development of CIIT, since its inception in 1998.

A student receiving degree from the outgoing Rector of CIIT at the Institute's 100th Convocation

CIIT Strengthens Linkages with Foreign Institutions

British Council organized a UK – Pakistan Partners' Event from 24th-26th April 2017, which was attended by 20 guests from various higher education institutions from the UK. Received by Rector CIIT, Prof. Dr. Raheel Qamar, the delegation was taken to Junaid Zaidi Library where an interactive panel discussion on the theme of "Student Experience: Are Students Products or Customers?" was arranged by the International Office. The panelists of the discussion included Dr. Fiaz Hussain, Associate Dean (International) Cardiff Metropolitan University; Dr. Aneel Salman, Assistant Professor Management Sciences Department CIIT; and Mr. Wajid Ali, International Partnerships Manager, University of Reading.

A two-member delegation from Macquarie University, Australia, comprising of Mr. Abizer Merchant (Director, South Asia and Middle East) and Mr. Tanveer Shaheed (Regional Director, South Asia and Middle East) visited CIIT for an official meeting with Management Sciences Department, headed by Dr. Muhammad Tahir (Head of Department) of CIIT. The university promises to offer special bursaries for CIIT students to avail the opportunities to study and work in Australia.

During the reporting period, CIIT hosted a delegation visit from China University of Petroleum Beijing (CUPB) comprising of Mr. Sun Xudong, Vice Principal of CUPB-Karamay Campus, Mr. XieOingbin, Dean, Faculty of Petroleum, and Ms. Liu Pan, International Admission Officer. The highlight of this interaction was the signing of Intent of Cooperation between the two institutions.

CRI of CSIR, Ghana, Releases Four New Yam Varieties

The Crops Research Institute (CRI) of the Council for Scientific and Industrial Research (CSIR) has released four new yam varieties, namely Afaase Adepa, Afaase Hoodenfoo, Afaase Biri and Afaase Soanyinto. The new varieties, which have been tried and evaluated for over 10 years, are said to be very nutritious, high yielding and pest resistant, can be used for ice-cream and noodles and safe for diabetic patients. During an event held in Kumasi on April 18, 2017, the new varieties were officially introduced by Dr. Emmanuel Otoo who led the 11-member team, which worked on these varieties of yam.

Dr. Otoo said that the research conducted on new varieties had shown that they could be used as a substitute for white yam, which is widely consumed in the country. Moreover, these can be used in other food products, such as ice-cream and noodles, and even in the cosmetic industry for body cream. According to him, there is a high market demand for the varieties in the sub-region and mentioned countries such as Burkina Faso, Mali, Niger and Cote d'Ivoire, where water yam is in high demand.

EMBRAPA Agrobiologia, Brazil, Research helps Cheapen Degraded Land Recovery

A simple and cheap technique, which can help the recovery

of degraded areas at half the cost of traditional methods has been developed by EMBRAPA Agrobiologia scientists. According to the report of March 7, 2017, the method involves use of cardboard to control weeds by crowning (removing weeds by cutting through below their "crown"). Material as abundant as pizza boxes can be used to apply this technique in activities. The technique can make pasture recovery financially possible for smallholders. Brazil today has about 21 million hectares of Permanent Preservation Areas and Legal Reserves that need to be rehabilitated, most of which have been used as pastures.

The traditional methods to control weeds require too much labour with low operational income, which burdens environmental rehabilitation projects. The new method, which has already been used in croplands, is a novelty for reforestation with native species. In forest recomposition projects, most costs are associated with the control of weeds that endanger the seedlings' growth and survival. About two thirds of the investment are destined to control the so-called weed competition.

President of RSS, Jordan, Honored by UC, Berkeley, USA

During a recent visit to the University of California, Berkeley, Her Royal Highness Princess Sumaya bint El Hassan of Jordan, was awarded a Chancellor's Citation by Chancellor Nicholas Dirks. The Chancellor's Citation is awarded to distinguished visitors, alumni and friends whose great achievements the university salutes and whose presence honors and benefits the campus. The princess, who is also the President of Jordan's Royal Scientific Society, is a strong advocate of science as a catalyst for change in the Arab world.

The officials of the Berkeley Global Science Institute (BGSI) also met Her Excellency to discuss plans for building a Reticular Foundry, to serve as a hub of scientific research attracting top talent from throughout Jordan and the Middle East region. This joint partnership will train the next generation of problem-solvers, innovators, and scientific leaders.

HRH Princess Sumaya receiving Chancellor's Citation at UC, Berkeley

During her acceptance speech, HRH Princess Sumaya said that the onus is on science to search for solutions to modern-day problems, and expressed her wish that the world's scientists, regardless of culture or background, can work together to find sustainable solutions to global issues like energy, food, water and climate change.

New Genome Mapping Machine Acquired by a Centre of ICCBS, Pakistan

The L.E.J. National Science Information Centre of the International Centre for Chemical and Biological Sciences (ICCBS) organized a three-day workshop on "Next Generation DNA Sequencing Data Analysis" from March 27 to 29, 2017. The workshop was designed for early career life scientists, post-doctoral fellows, M. Phil and Ph.D. students, and corporate professionals working in the areas of genomics and bioinformatics.

Speaking on the occasion, Patron in Chief ICCBS, Prof. Atta-ur-Rahman, informed that Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) of ICCBS has procured a human genome mapping machine that would help scientists for better diagnosis and treatment of fatal diseases like cancer. He said that Jamil-ur-Rahman Center was setup as a part of PCMD to strengthen the ongoing molecular medicine research efforts and to train the manpower in this cutting edge area of biology.

ITI, Sri Lanka, Helps Initiate Production of Kidney Dialysis Solution

A group of scientists from Chemical and Microbiological Laboratory of Industrial Technology Institute, Sri Lanka, developed kidney dialysis solutions last year. The clinical trials were carried out at Kandy Teaching Hospital gave positive results, paving way to carry out much needed kidney dialysis on thousands of patients at a lower cost.

In April 2017, under instructions from the Presidential Task Force on Prevention of Chronic Kidney Diseases, the Ministry of Health granted Rs. 35.2 Mn to Kandy Teaching Hospital to initiate a semi automatic production facility to produce the two solutions used in dialysis. The multi-disciplinary project will be handled by scientists and engineers from ITI and the doctors in Nephrology Unit of the Kandy Teaching Hospital.

MOVING FORWARD WITH SCIENCE AND TECHNOLOGY

Abdul Majid Qureshi*

It is important to demonstrate to the wider public why science is relevant to their daily lives and to engage them through debate and dialogue on related issues, helping to establish a relation between science and society. Media engagement for building awareness among the masses is among the most daunting challenges of Science popularization in Pakistan. Some important resolutions require addressing the ailing S&T sectors of nations of the South for adopting a scientific culture, and benefitting from the outpour of knowledge economy could be as below.

1. Higher Investments in Science

The most profitable venture is investing in science. Countries that have invested heavily in Education and Science reaped benefits of fast economic growth, a fact which is now an open secret for the rest. Pakistan needs to push for bigger investments in riskier new areas for bigger returns. Some of the key areas have already been identified in the current S&T policy including nanotechnology, computation science and renewable energy. However, the gross spending on R&D (GERD) is an important marker which can help track how much is being invested in the future of science. It is shamefully low at the moment and needs generous review.

2. Prioritize Relevant Areas of S&T

In order to capitalize on its meager financial commitments to the sector and its immense human resource, it is imperative for Pakistan to identify and achieve consensus over its priority areas that are most pertinent to its development and economic needs. While a focus on applied sciences and technology is required, this must not be at the cost of abandoning excellence in basic scientific research. After all innovation is strongly linked with knowledge creation capacity in basic sciences.

3. Aim for an Innovation Based Economy

Leaders of the global economies innovate and draw the fruit of invention through intellectual property enforcement, and move on to innovate further. Countries that lack this capacity have to buy innovations from advanced countries and have to put them on the production line. Our focus must also be on innovating and generating patents in our priority areas. This makes the role of universities that are the true centres of innovation in Pakistan ever more important. A weak patent enforcement offers the least reward for innovation, particularly in the area of ICTs, where Pakistan has immense potential to catch up with the rest of the world.

4. Encourage Entrepreneurship in Science

Gone are the days when science remained just in the lab or in theory books, today science is creating value that can be sold as products and solutions. Instead of trying to create jobs, the government should enable people to create jobs for themselves as well as others. Industries that once used to house, expensive R&D Laboratories, now hunt for ideas in colleges and universities through various competitions.

Science Parks are places where industry comes close to the lab, or where the labs open up to the industry. Such initiatives of scientists doing R&D in the private sector, with labs affiliated with universities have still to take off in Pakistan. Moreover a comprehensive tax rebate policy is required for promoting spin-offs or startup businesses emerging in incubation centres created by the HEC in various universities.

5. Expand Science Media for Science Communication

In order to educate the masses, and to present a softer image of the country to the world, science media certainly needs the patronage of the government. In a Seminar on Science Communication and Journalism, held in April 2015, the then Federal Secretary, Ministry of Information and Broadcasting, urged the media to allocate at least 5% of the media space to scientific news. This was a welcome step, for the scientific community, however it was not followed up by commitments from the Media regulatory authorities to urge electronic and print media to give time to science communication. Moreover encouraging dialogue through these media among the scientific community would help nurture confidence in scientists for solving real world problems.

6. Science at the Center Stage of Public Diplomacy

Pakistani politicians are faced with huge challenges in public diplomacy, despite being essentially required, issues like the Kalabagh dam, nuclear or coal based power plants, routes of important road networks, water distribution among provinces and land reclamation, tend to get shrouded in political controversy. Science offers viable solutions in all these potential conflict scenarios, which may be acceptable for all,

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He tweets **@amqureshi83.**

and so deserves to be put on the center stage in matters of public diplomacy. While office bearers can be trained in simple scientific advancements, a nexus between the scientific community and public policy officials can also be created by creating official forums for consultation on important development matters.

7. Use Science for National Integration

Science can attract human resource regardless of their background, provincial ethnicity, creed or caste, therefore has an important role to play in creating harmony within the country, through scientific exchanges. In Europe for instance, researchers design cross-boundary projects, according to a European framework so as to promote harmony within their member countries.

Scientific resources and centers of excellence must also be diffused geographically on these lines rather than concentrating them in dense population centers. This will not only help in bridging differences but also enable wider understanding of human issues beyond geographic boundaries between provinces. In the long run such established bridges will cement national harmony, reduce resentments to the equitable access of these resources.

8. Patronize Science Diplomacy Initiatives

The leadership role of Pakistan in science advocacy came right from the time of Dr. Abdus Salam, and over the years, Pakistan has held the flag of promoting science based diplomacy in OIC countries, ECO and SAARC regions, as well as countries of the South at large. Due to its visionary scientific leadership, Pakistan drew several fold benefits from its early interventions, and knowledge sharing exercises, with both developed as well as developing countries. This enabled participation of its Scientists to get exposed to Big Science ventures like CERN and SESAME as well as address its security needs through the linkages developed over years.

The fact that Islamabad hosts secretariats of three international scientific diplomatic organizations, including COMSTECH (57 member states), ECO Science Foundation (10 member countries), and COMSATS (24 member states), is not only a matter of distinction for a developing country. A strong scientific community in the country will help keep Pakistan connected with the rest of the world. In order to continue this leadership role, it is imperative for the government to increase support for these “Science Diplomacy” initiatives, which are silently working towards achieving our foreign policy objectives and promoting a peaceful and progressive image of Pakistan. While Pakistani Engineers and Scientists have remained prominently placed on ‘Big Science’ projects like CERN, it’s time for us to enter into new Big Science Projects like the ITER, which offer unlimited clean energy, making it relevant to our problems with producing energy.

9. Promote Partnership Among Scientific Organizations

Despite having several organizations with distinct mandates, there is very little cooperation within the scientific community, governed by the Ministry of Science and Technology. Most organizations like PCRET are suffering from a lack of technical manpower, others with a lack of initiative or resources. While some of these issues can be overcome through engaging in partnership, the organizations need a heavy dose of investment followed by accountability to get back into business. The organizations must resolve to initiate at least one new collaborative project every year where their expertise and capacity can be put to test.

10. Engage Diaspora

Pakistan has been endowed with immense resources within its geography, but its biggest asset is perhaps the diaspora that rests outside. In order to turn around their scientific sectors and economy, China in the 80’s and 90’s and India most recently effectively mobilized their diaspora. The HEC of Pakistan also started a program to attract foreign professors, which was later shelved due to lack of resources. This program also came under immense criticism due to lack of review and accountability. Despite its shortcoming the program successfully invited many world class professors to join Pakistani varsities in a time when these institution were fast growing under the dynamic leadership of Prof. Atta-ur-Rahman. Although some very successful examples came from this foreign faculty program, it was sadly abandoned.

Conclusion

Pakistan spends around 3.5% of its GDP on Defense, while only 2.5% on Education, the spending on Research and Science & Technology is far less, yet it was these scientists in 2015, who based on sound scientific data, were able to extend the Pakistani continental shelf claim, giving Pakistan sovereign rights over additional area of 50,000sq km beyond Pakistan’s Exclusive Economic Zone. Thus increasing Pakistan’s maritime area from 240,000 sq km to about 290,000 sq km. Some thing that could not have been accomplished through military means only.

The direction we take today, while repositioning Pakistan in the new world order, will largely influence the lifestyle of our people in the coming decades. Science and Technology have been fundamental in the growth and progress of all nations and we must use this day to acknowledge that the link between Science, Policy and Society is one that holds the key to the bright future of our nation.

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Potential Cancer Treatments using Mitochondrial DNA

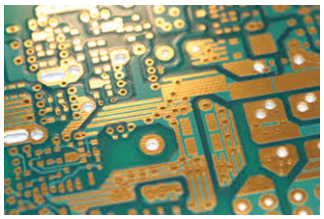
A 5-year long study revealed a mechanism for repairing the damaged mitochondrial DNA, paving a way towards treatment of cancer as well as neurodegenerative diseases. Another implication of this research can be the clinical advances in mitochondrial donation for three-parent babies (*Science Daily*, 28th April 2017). The study suggests that the enzyme TDP1 is responsible for repairing the damage of mitochondrial DNA.

Mitochondria are known as the powerhouse of cells because they generate all the required energy for cellular activities, and have their own DNA as well. During the process of protein and energy production, a large number of reaction oxygen species (ROS) are produced having potent harmful effects on the mitochondrial DNA. However, the new research reveals that mitochondria have their own repair toolkit, which is able to maintain the integrity of DNA. The repair enzymes can cut, hammer and seal the breaks.

Cancer relies on rapid division of cell which needs a lot of energy and hence healthy mitochondria. If we find a way to selectively damage the mitochondria in cancer cells by slowing the repair mechanism, cancer can be treated. For this purpose TDP1 enzyme is to be targeted which will halt the mitochondrial DNA repair and will lead towards the new ways to treat cancer.

Nanotechnology to Recycle Electronic Waste

Nanotechnology can be used to recycle Printed Circuit Boards (PCBs), according to a *SciDev.Net* report (12th April 2017). The PCBs can be pulverized into nanoparticles from which valuable constituents including oxides, polymers and metals can be recovered. Pulverization is environment friendly and scalable method to recycle PCBs. The research is based on the principle that the ultra-low temperature makes materials brittle and easy to pulverize and separate.

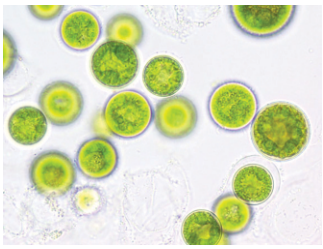


The PCBs were placed in a rotating cylinder and temperature was brought down to as low as -119 degree Celsius, after which the sample was bombarded with steel balls which shattered them into nanoparticles which were then dispersed in water. This method can handle most of PCBs after some preliminary sorting. It is an environmental-friendly process as valuable components are obtained from pulverization. Besides this, nanoparticles can also be used to strengthen the polymer composites, 3-D printing, and making of polymer powder based paints.

Improved Method for Bio-fuel Extraction from Microalga

Recently, researchers at Kumamoto University, Japan, have improved the method of extraction of bio-fuel that is economical and less destructive to the microalga (*ScienceDaily*, 28th April 2017). Biodiesel extracted from microalgae can be a greener alternative to liquid fossil fuels as the carbon dioxide released from their combustion has no additional CO_2 toll on the environment.

The existing commercial methods of extraction of bio-fuel from microalga involve the use of pulsed electric field (PEF) for milli or microseconds to weaken cell walls which increase the permeability of cells and allow the extraction of elements inside. The microalga are rendered useless for further use after such an extraction. In the aforementioned research, the PEF was applied for nanosecond at high voltages which is less destructive as compared to traditional oil extraction method noted earlier. Although the major obstacle in replacing diesel with biodiesel is its cost of production but in this technique, the microalga are not destructed instead biodiesel is extracted just from the matrix which reduces production cost. Thus, the microalgae used for extraction of biodiesel can form colonies again for further extraction.



Genetic Modification to Enhance Sucrose Yield

The Brazilian scientists are taking steps to produce more sucrose naturally by genetically modifying sugarcane (*SciDev.Net*, 20th April 2017). Commercially, artificial growth regulators or chemical ripeners are used to increase level of sucrose in sugarcane. These methods could reduce flowering and result in prolonged harvesting. Ethylene and ethyphon are the most common growth regulators used for this purpose. In a study conducted at the University of Campinas, Brazil, the genes which are associated with action of ethylene during the ripening of sugarcane were identified. Genes associated with sucrose metabolism, and the hormones that are involved in sucrose accumulation were also discovered. With this knowledge, sugarcane plants can be manipulated for genetic improvements. Varieties can be developed that over express these genes and hence the yield of sugarcane can be enhanced.

PROFILE OF HEAD OF COMSATS S&T CENTRE OF EXCELLENCE

PROF. STEPHEN E. ONAH, DIRECTOR/CHIEF EXECUTIVE, NMC, ABUJA

Prof. Stephen E. Onah has been the Director/Chief Executive, National Mathematical Centre, Abuja, since 1st August 2016. He is a man of humble disposition, notable achievements and remarkable successes.

Previously, Prof. Onah has been the Deputy Vice-Chancellor (Academic), University of Agriculture, Makurdi and Distinguished Professor of Stochastic Modeling and Numerical Computing.

Prof. Onah was born on 2nd September 1959 at Uje-Anchim in Oju Local Government Area, Benue State, Nigeria. He began his educational career in January 1966 at the Wesley Transferred Primary School, Anchim(now, LGEA School, Otunche) in Oju local government area. He later proceeded to the Government College, Makurdi, in January 1972, where he obtained the West African School Certificate (WASC) in June 1977.

He went to the School of Basic Studies, Ugbokolo, in 1978 and proceeded to the famous University of Jos, in 1979. He obtained both his B.Sc. (Hons) and M.Sc. degrees in Mathematics in 1982 and 1987, respectively. Prof. Onah also bagged his Ph.D. in Mathematics at the premier University of Ibadan, in 1998.

Prof. Onah began his career as a Graduate Assistant at the University of Agriculture in 1983. With hard work and dedication, he rose steadily through the ranks and was promoted Professor in October 2006. Prof. Onah was Deputy Dean of the College of Science from July 2007 to March 2010, and was appointed the Deputy Vice-Chancellor (Academic) in March 2010, a position he occupied till March 2014.

Dr. Onah's broad area of research interest is Computational Mathematics, with a specific focus on stochastic modeling and numerical computing (by finite difference, finite element and boundary element methods). He has conducted research and published papers on a number of related topics, such as Modeling of bio-systems and Modeling of Economic Systems.

As an erudite and productive scholar, Prof. Onah has contributed a lot to scientific publications. He also contributed immensely to national, international and electronic journals, which include Journal of Applied Mathematics and Computation, Journal of Science Research, University of Ibadan; Journal of Nigerian Mathematical Society (JNMS); Journal of Mathematical Association of Nigeria (JMAN); Nigerian Journal of Pure and Applied Sciences; Science World Journal; Journal of the Nigerian Association of Mathematical Physics among others.

He has contributed to development of high-level manpower in the country: he has graduated a number of Ph.D students, one of whom is a Professor and Vice Chancellor of a State University in Nigeria.

As a seasoned administrator, academician, professional member of both the Nigerian Mathematical Society (NMS) and the Mathematical Association of Nigeria (MAN), Prof. Onah has delivered papers in numerous conferences, both at home and abroad, between1989 to 2016.

In recognition of his contribution to the development of the University and the larger society, Prof. Onah has received many awards. He has a passion for having a positive impact on the lives of others in the society. He is a fellow of the Institute of Industrial Administration (Nigeria). He was listed in the 15th Edition of Marquis' Who is Who in the World 2010. Some of the awards and honours conferred on Dr. Onah include:

- Exemplary Comradeship and Excellent Leadership, 2005; a merit award by the Student Union, University of Agriculture, Makurdi;
- Reservoir of Knowledge Award, 2010; and Academic Noble – an international award by the Institute of Industrial Administration;
- Kwame Nkrumah Leadership Award (West African Student Union – 2016;
- Nelson Mandela Leadership Award (African Youth Parliament) – 2017;
- Ambassador of Ethics and Conscience 2017.

He was also inducted into the Ethics and Conscience Hall of fame by Centre for Ethics and Self Value Orientation – 2017.

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COMSATS' BRIEF AND ANNOUNCEMENTS

Selected Forthcoming Scientific Events in COMSATS' Countries

7-30 July 2017	International Symposium on Climate Change, Environment And Societies in Africa, Dakar, Senegal ***(www.ucad.sn)***
24-26 October 2017	African Summit on Entrepreneurship and Innovation, Kampala, Uganda ***(www.asenti.org)***
6-10 December 2017	TECNOVITIS 2017 - Technology Fair for Viticulture, Park Biological Station, Brazil ***(www.tecnovitis.com.br)***

Eighth World Science Forum on 'Science for Peace' Jordan, 7-11 November 2017

The 8th World Science Forum (WSF) 2017 is being hosted by the Hashemite Kingdom of Jordan, under the patronage of His Majesty King Abdullah II Ibn Al Hussein. The management of the Royal Scientific Society, Jordan, will be the key organizers of this year's forum with the theme "Science for Peace" that marks a recognition of the global nature of the challenges that face all humankind, and underlines the global responsibility to tackle these challenges through science and policy for the benefit of all. The President RSS, HRH Princess Sumayya bint el Hassan, holds the Chair of WSF2017.

Scientists, researchers and policymakers from all disciplines and backgrounds are welcome to contribute to scientists, researchers and policymakers from all disciplines and backgrounds that would deliberate on common challenges facing humanity and their solutions through science and policy. For more information, please visit worldscienceforum.org and write to **wsf2017@rss.jo**.

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 10 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 scholarships for post-doctoral fellowships and MS and Ph.D studies at the International Center for Chemical and Biological Science (ICCBS), Pakistan.
- Five scholarships for post-doctoral fellowships at the National Research Centre (NRC), Egypt.

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

Science Vision - Call for Papers

COMSATS invites scholarly contribution for Volume 22 of its bi-annual journal, Science Vision, which aims at highlighting the important scientific and technological developments having a bearing on socio-economic conditions of the people. For more information, please visit the journal's website: **www.sciencevision.org.pk**.

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 24 developing countries as its members, spread across three continents, i.e., Latin America, Africa and Asia. A network, of 20 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.

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