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Group Photo of the organizers and participants of International Conference on Mathematical Modelling, Abuja, Nigeria (28-29 December 2015)

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From the Executive Director's Desk

In the last issue of COMSATS Newsletter for the year 2015, it will be instructive to recall what the year entailed for the world at large, in general, and for COMSATS, in particular. In so far as it is difficult to characterize a temporal segment of the history of mankind as generally good or bad, what may be of interest is to identify the best and the worst occurrences during the relevant period. The relative frequency of all that happened within extreme ends of these categories, could serve as a measure of objective review, although the choice of extremes in itself could be different, depending on different perspectives. In terms of human suffering, the worst episode that occurred in 2015 was epitomized by the corpse of a three-year old Syrian refugee child washed ashore on a Turkish beach. The mayhem in Syria, created by regional rivalries and conflicting interests of world powers, led to the traumatization of a whole nation and exodus of millions in search of refuge. The champions of human rights, who never fail to sermonize developing countries about rights of refugees and legal obligations of States in this respect, balked when hordes of desperate victims made their way to Europe, risking the lives of their families en route to a perceived safe haven. While most refugees suffered inhuman treatment on some European soils, the well-known face of the special envoy of United Nations High Commissioner for Refugees was most conspicuous because of its absence. Except for Germany, most rich nations shied away from accommodating sufficient number of refugees claiming their inability to meet financial and social costs, notwithstanding the generous spending on bombing Middle Eastern countries. Surely, this year saw one of the worst human tragedies and a woefully inhuman response to it.

The hope for a better future for all nations, irrespective of their current economic standings, was of course rekindled in 2015 with landmark achievements at some UN forums. In New York, the United Nations Sustainable Development Summit approved the 2030 Agenda with 17 Sustainable Development Goals (SDG) having 169 associated targets. This resulted in a smooth upgrading of Millennium Development Goals (MDG), which were set for the first 15 years of the new millennium. It is claimed that the new goals are 'supremely ambitious'. Some

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NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

Executive Director COMSATS visits IROST, Iran

Interactivity with COMSATS' Network of Centres of Excellence is a high priority at COMSATS Secretariat to ensure mutually beneficial relationships among the member institutions and sound technical inputs for COMSATS' international programmes and activities. After the 17th COMSATS Coordinating Council Meeting, May 19-20, 2014, Tehran, Iran, hosted by COMSATS' Iranian Network Member, the Iranian Research Organization for Science and Technology (IROST), the Executive Director COMSATS, Dr. I.E. Qureshi, visited the Islamic Republic of Iran during December 2015. Arranged by Mustafa Prize Foundation, the visit to Iran was primarily undertaken to participate in the Mustafa Prize 2015 ceremony.

On 26th December 2015, Dr. Qureshi held a meeting with the newly appointed President of IROST, Prof. Fathollah Moztarzadeh, accompanied by Prof. Abdolreza Samimi, Vice President for Technology Development IROST, and Dr. M. Molanejad, Acting President for International Cooperation IROST. In his meeting with the senior IROST officials, Dr. Qureshi discussed key outcomes of the 3rd General Meeting of COMSATS, held in Ghana (October 2015), which included harmonized Statutes of COMSATS; and extension of COMSATS' Strategic Plans for the next five years. The purpose and procedures involving COMSATS' International Thematic Research Groups (ITRG) were also discussed.

The officials also deliberated upon were also discussed the matter of IROST establishing a 'Centre for Human Research Development in Advanced Science and Technology', which was proposed during the 18th Council Meeting (2015). IROST's expected roles and activities with regard to COMSATS' ITRGs discussed during the meeting touched upon the matters of leading the Group on 'Renewable Energy', and participation in another Group, i.e., 'Climate Change and Environmental Protection' led by COMSATS' Centre of Excellence in China. IROST is one of the Centres offering scholarships to students from COMSATS' Member States. Related issues were also discussed along with the possibility of Iranian students availing similar offers from COMSATS Institute of Information Technology (CIIT). The officials discussed ways to mobilise Iran's Annual Membership Contribution to COMSATS and donation towards its Endowment Fund, as well as to seek support for COMSATS Technology Park from Iranian institutions, like IROST Incubation Centre and Pardis Technology Park.

Executive Director COMSATS Presenting a Plaque to President of IROST, Prof. Fathollah Moztarzadeh

The important developments taking place at IROST Incubation Centre were shared by Dr. Molanejad. He informed Dr. Qureshi that Prof. Nasrin Moazami would lead the COMSATS' ITRG on 'Renewable Energy'. The Executive Director strongly advised that correspondence should be initiated by Prof. Moazami to select her Group Members. Prof. Samimi assured Dr. Qureshi that the issues raised by him will be thoroughly followed up. On behalf of his organization, Prof. Moztarzadeh pledged continued support to COMSATS' programmes.

Apart from attending the Mustafa Prize 2015 ceremony and holding meetings at IROST, high-points of Dr. Qureshi's visit to Iran included visits to Pardis Technology Park, AryoGen Biotechnology Company, and Iran Nanotechnology Initiative Council (INIC). During the course of the visits to these Centres and interactions with local and foreign S&T leaders participating in Mustafa Prize ceremony, the programmes and activities of COMSATS were highlighted and collaborations sought wherever feasible.

COMSATS Celebrates World Science Day 2015

To observe World Science Day 2015, COMSATS held a discussion forum on 'Science for a Sustainable Future', on November 10, 2015, in collaboration with Pakistan Academy of Sciences (PAS). The forum was presided over by Dr. Ishfaq Ahmad, former Advisor to the Prime Minister of Pakistan on Science and Technology and Chairman Board of Governors, National Centre for Physics (NCP), Islamabad.

Speaking on the occasion, Dr. Ahmad noted that modern scientific and technological developments can help societies to duly utilize the renewable energy sources, like hyrdo, solar, wind and geo-thermal, for reducing dependence on fossil fuels in order to achieve cost-effective and environment-friendly industrial productions. Dr. Ahmad praised COMSATS for its leadership role in regularly celebrating the World Science Day in Pakistan.

The President of PAS, Dr. Anwar Nasim, opined that amid

the public expressions of recognizing science as a vehicle for socio-economic development by political leaderships and decision-makers of the developing countries, very little is being done by way of actions to back these statements. He said that World Science Day is an opportunity to make a commitment to encourage young scientists to take a leadership role in future. He appreciated COMSATS Science Diplomacy Programme launched in early 2015, as a major initiative for advocacy of science.

The technical deliberations of the event comprised of three presentations on: 'Status of Science in a contemporary Pakistani Society' by Dr. Ayesha Razzaque, an Independent Education Consultant; 'The Case for Next Generation of Life Sciences' by Dr. Faisal F. Khan, Director, Institute of Integrative Biology, CECOS University of Information Technology and Emerging Sciences; Peshawar, Pakistan; and 'Energy Options for a Sustainable Future', by Dr. M. Pervaz, Director-General, Hydrocarbon Development Institute of Pakistan.

Dr. Razzaque presented a case for creating a science-literate society based on the fact that such societies make informed and sustainable choices, particularly in areas of healthcare, energy, and environment. Dr. Faisal Khan asserted the urgent need to encourage start-ups to bridge the gap between academia and industry in Pakistan, especially with regard to the emerging sciences. He considered emerging trends related to Synthetic Biology as one such opportunity for Pakistan and urged the relevant quarters to take immediate measures to optimally benefit from it. Dr. Pervaz advocated technology-transfer and technical cooperation among the developing countries, and diversification of energy supply as means for achieving reduced energy-related imports.

World Science Day 2015: Discussion Forum Chaired by Dr. Ishfaq Ahmad

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may even find these to be utopian. However, hope is the best tool for survival and should remain intact. On the heels of SDG, came the first-ever universal legally-binding global climate agreement as a result of the 21st Conference of Parties (COP21) to the UN Framework Convention on Climate Change (UNFCCC) held in Paris, France. The leaders of 196 countries effectively managed to develop a consensus on measures to save the planet by keeping the global average temperature below 2°C above the pre-industrial level. That too is an ambitious enterprise. Hopefully, the principal polluters, past and present, will take responsibility of the harm done so far, and the countries aspiring to become industrial nations will avoid follies of their predecessors by taking measures recommended in the Paris Agreement.

COMSATS is a small player on the global Sustainable Development stage. Yet, it has been playing a strong role in facilitating South-South cooperation in several unique manners in sectors of education, scientific research, and S&T collaboration among its 23 Member States. It provides interactivity among scientific leaders through its annual meetings of the Heads of 20 Centres of Excellence spread across four continents; graduate-level educational facilities available at COMSATS Institute of Information Technology; and multi-national research in key areas of global interest undertaken through its programme of 'International Thematic Research Groups' (ITRG). The spectrum of activities under the ambit of 'capacity-building' encompasses technician level workshops on repair and maintenance of scientific equipment to frontiers of science symposia, such as a symposium celebrating the International Year of Light that attracted top-level scientists working on cutting-edge light-based technologies. A high point of the year was the holding of 3rd General Meeting of the Commission held on 27th - 28th October in Accra, the capital of the Republic of Ghana – the country whose President is the current Chairperson of COMSATS. The meeting took decisions having far-reaching consequences for the future growth and higher impact of the organization, such as harmonizing its statutes, establishing endowment fund, re-election of incumbent Chairperson and approval of 5-year strategy for COMSATS. The year ended on a good note with the organization of an International Conference on Mathematical Modeling and the second meeting of Nigeria-based COMSATS' ITRG working on mathematical modeling of air pollution with respect to its environmental and medical implications (page 5).

The readers are most welcome to share their thoughts on the observations made in foregoing paras, or any of the issues relevant to this Newsletter, COMSATS programmes, and global sustainable development challenges.

The statements were followed by a discussion session moderated by Dr. Anwar Nasim. The participants of this session included, Dr. Manzoor Soomro, President ECO Science Foundation; Dr. Zabta Khan Shinwari, Secretary-General of PAS; Dr. Hamid Saleem, Former Director-General, NCP (Pakistan), as well as COMSATS' Science Ambassadors, Dr. Arshad Saleem Bhatti, and Dr. Athar Hussain. Also present on the occasion were other officials of COMSATS Secretariat including: Mr. Tajammul Hussain, Advisor-Programmes; and Mr. Abdul Majid Qureshi, COMSATS' Coordinator for Word Science Day.

A Group Photo of the Organizers, Speakers and Participants of the Nigeria Conference

The discussants touched upon the matters related to ethical aspects of science, need for making societies science conscious, updating scientific curricula to help the students in understanding the practical implications of science, revisiting the existing R&D and S&T related strategies, devising a roadmap better suited for indigenous needs, and rationalization of fund allocation among primary education and other important issues like technology-transfer between academia and industry. Relevant government institutions were urged to ensure due projection of science to masses through electronic media.

NMC-COMSATS-ISESCO International Conference on Mathematical Modelling

The International Conference on Mathematical Modelling was jointly organized by COMSATS, the Islamic Educational, Scientific and Cultural Organization (ISESCO) and COMSATS' Centre of Excellence in Nigeria, the National Mathematical Centre (NMC), on December 28-29, 2015, in Abuja, Nigeria. Hosted by NMC, Nigeria, the event was held to provide a forum to researchers and scientists belonging to the common Member States of COMSATS and ISESCO for the exchange of knowledge and expertise in the field of mathematical modelling.

Prof. Adewale Roland Tunde Solarin, Director/Chief Executive NMC, Nigeria, inaugurated the event on 28th December 2015, at the Auditorium of the Nigerian National Atomic Energy Commission, Abuja. Forty senior officials from relevant universities, research organizations and government departments of Nigeria, as well as local media personnel attended the inaugural ceremony.

In his inaugural address, Prof. Solarin thanked COMSATS and ISESCO for collaborating with NMC to organize this important event, and gave an overview of the event. He informed that NMC has been selected for establishment of UNESCO Professorial Chair Programme in Mathematics (Algebra). He noted that some Nigerian students have been availing scholarships offered by COMSATS Institute of Information Technology (CIIT), Pakistan, and thanked COMSATS for its consistent support towards the capacity-building of Nigerian institutions. In his message read-out on the occasion by Mr. Farhan Ansari, Sr. Assistant Director (Programmes), COMSATS Headquarters, the Executive Director COMSATS, stated that COMSATS is committed to developing and strengthening linkages among the countries of the South for the exchange of resources, technology, and knowledge.

Dr. Ismail AbdelHamid, Science Expert, ISESCO, conveyed the greetings from the Director General of ISESCO, H.E. Dr. Abdulaziz Othman Altwaijri, and expressed pleasure on ISESCO's partnership with COMSATS and NMC for organizing this international conference. He informed that ISESCO's cooperation with COMSATS has been very fruitful. Dr. AbdelHamid also expressed pleasure on ISESCO's involvement in the activities of COMSATS' International Thematic Research Group on Mathematical Modelling, by way of sponsoring the research project being executed by the Group. Other senior officials and academicians from universities and S&T/R&D organizations also delivered goodwill messages during the inaugural ceremony.

During the technical sessions of the conference, distinguished speakers presented research papers on different topics related to the theme of the conference. Prof. Benjamin Oyediran Oyelami of NMC, Nigeria, presented his research on modelling the effect of pollutants on the lower and upper human respiratory tracts. In his research presented during the conference, Prof. Oyelami considered the models for aerodynamic behaviour of particulates (pollutants) that measure the rate of sedimentation and diffusion of the pollutants into the airways, with a view to understand the physiology and pathology of the airflow when pollutants are introduced into human respiratory

system. Dr. Salman Amin Malik, Assistant Professor, Department of Mathematics, CIIT, Pakistan, presented his work related to the calculation of Biochemical Oxygen Demand (BOD), which is widely employed to measure the pollution extent due to organic agents, as well as to evaluate the water characteristics.

Mr. Mohammad Nashir Uddin, Senior Scientific Officer, Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh, presented his research related to developing a Method for Rapid Quantification of Simple Sugars in Mango Juice through Chemometrics. In this regard, he examined the ability of Artificial Neural Network (ANN) model as well as Principal Component Regression (PCR) and Partial Least Squares Regression (PLSR) methods to quantify simple sugars in mango juice. Prof. J. A. Ogidi, Biomathematics Programme, NMC, Nigeria, presented his research on Ecological Risk Assessment, and elucidated the phenomenon as a process, concept and useful tool that could ameliorate damage to the environment.

Dr. Othman Al-Mashaqbeh, Assistant Researcher, Royal Scientific Society, Jordan, presented his research on the Assessment of Stormwater Runoff, which estimated the levels of pollution loads carried by stormwater runoff entering the King Talal Dam (KTD), during October 2012 to October 2013. Prof. M.O. Ibrahim, University of Ilorin, Nigeria, explicating his work on Global Analysis of an Ebola Model, shared a mathematical model for the transmission dynamics of Ebola Virus. The model considers the impact of multiple-control measures for transmission of the disease.

Other topics covered during the event included: Stability and Bifurcation Analysis of Ebola Deterministic Model; Solution of SIQR Model by Homotopy Analysis Method; Modelling and Analysis of an Age Structure Model of HIV; A Nonhydrostatic Atmospheric Model for Weather Simulation over Minna; Modelling the Transmission Dynamics of Hepatitis-B Virus (HBV) Infection in the Presence of Vaccination and Behavioural Change; Mathematical Model for Dynamics of Tuberculosis Vaccination; and Mathematical Modelling of Measles Epidemiology in Nigeria.

The event concluded on 29th December 2015, with notes of thanks from the organizers, and distribution of certificates.

COMSATS' International Thematic Research Group Meeting on Mathematical Modelling held in Nigeria

The 2nd Meeting of COMSATS' International Thematic Research Group (ITRG) on 'Mathematical Modelling' was held on 30th December 2015, on the sidelines of the Conference in Nigeria reported earlier. As the Lead Centre of the Group, NMC hosted the meeting. The Group is executing a joint research project entitled 'Mathematical Modelling and Simulation of Air and Water Pollution: Effects and Remedies', which is being sponsored under ISESCO-COMSATS Research Grant scheme.

The primary objective of the ITRG meeting was to discuss the progress made by the Group since its launching in December 2014, as well as to determine the future course of action. The meeting was chaired by the Group Leader, Prof. B. O. Oyelami, NMC, Nigeria. It was attended by research scientists from University of Ilorin, Nigeria; COMSATS Institute of Information Technology (CIIT), Pakistan; NMC, Nigeria; Royal Scientific Society (RSS), Jordan; University Cheikh Anta Diop (UCAD), Senegal; and National Water Resources Institute (NWRI), Nigeria.

In his opening remarks, Prof. Oyelami thanked COMSATS and ISESCO for providing the Group members another opportunity to meet and share their research progress. Mr. Farhan Ansari read out a message from the Executive Director COMSATS, in which he considered joint efforts by the developing countries imperative for addressing the trans-border effects of pollution. He expressed confidence that the Group could play a constructive role for enhancing the indigenous capacities of the developing countries to assess and mitigate the effects of air and water pollution.

The technical session of the meeting commenced with Mr. Ansari outlining the mission, structure and technical programmes of COMSATS, particularly the ITRGs. Subsequently, the Group Leader made a detailed presentation touching upon the proceedings and outcomes of the foundation meeting of the Group; NMC's progress with regard to the execution of the assigned research component; and proposed Action Plan of the Group for the year 2016.

The founding members of the Group from Pakistan and

Technical Session of ITRG Meeting in Progress

Nigeria shared their research progress, and sought guidance from the Group Leader regarding the difficulties being faced in executing their assigned components. The new participants identified different segments in which they were capable and willing to contribute. The distribution of research components/activities among the participants for the year 2016 was also done, and formalized through a Memorandum of Understanding that was signed by the participants belonging to Nigeria, Pakistan, Jordan and Senegal. An interim report is expected to be submitted by the Group during October 2016, and the final report during September 2017. A possibility was discussed about submitting a joint project proposal by COMSATS and NMC to National Water Resources Institute (NWRI), Nigeria, for seeking funds for the Group's research project. Furthermore, the Group Leader pledged to organize periodic meetings of the participating Nigerian scientists for effective execution of their assigned research components.

It was agreed that the next meeting of the group will be held in conjunction with the next ISESCO-COMSATS International Conference on Mathematical Modelling, which is scheduled to be held in 2017.

COMSATS Strengthens ties with Nigerian Focal Point

Mr. Farhan Ansari, Sr. Assistant Director (Programmes), COMSATS Headquarters, on his visit to Abuja in connection with COMSATS' two aforementioned events, held meetings with officials from Federal Ministry of Science and Technology (FMST), Government of Nigeria, COMSATS' Centre of Excellence in Nigeria, NMC, and High Commission of Pakistan in Nigeria.

A meeting was held with Dr. Habiba Lawal, Permanent Secretary, FMST, Government of Nigeria, on 31st December 2015, at the boardroom of the Ministry. Also present during the meeting were the respective Directors and senior officials of the Ministry; an official of NMC; and Mr. Asim Ali Khan, Head of Chancery, High Commission of Pakistan in Abuja, Nigeria. The purpose of the meeting was to brief the Permanent Secretary about COMSATS and its ongoing programmes in Member States; the organization's collaboration with Nigeria; and support sought from FMST for enhancing Nigeria's participation in COMSATS' programmes. Key outcomes of the 3rd General Meeting of COMSATS (27th-28th October 2015) and the 3rd Consultative Committee Meeting (26th October 2015), Accra, Ghana, were also shared with Dr. Lawal.

Mr. Ansari stated that NMC-Nigeria has been consistently participating in the annual meetings of COMSATS' Coordinating Council (participated in 16 out of total 18 meetings held so far). Moreover, he shed light on Nigeria's participation in the recent meetings of the Commission and Consultative Committee held in Ghana, in which Nigeria was represented by Mr. Abayomi Oguntunde, Director, Department of Bioresources Development, FMST, and Prof. A.R.T. Solarin, Director NMC. Mr. Ansari presented to the Permanent Secretary the documented details of the Ghana Meetings.

It was informed that COMSATS has, so far, jointly organized three capacity-building events and two ITRG meetings in Nigeria; provided travel grants to 19 scientists/students, as well as awarded postgraduate scholarships to 14 Nigerian students for studies at CIIT-Pakistan. He informed that NMC is leading COMSATS' ITRG on 'Mathematical Modelling', which held its second meeting in Abuja (30th December 2015) in conjunction with the afore-mentioned international conference (28-29 December 2015). Mr. Ansari also handed over to the Permanent Secretary the invoice of Nigeria's Annual Membership Contribution (AMC) to COMSATS for financial year 2015-16.

The Permanent Secretary was appreciative of COMSATS' enormous support towards the scientific capacity-building of her country. She pledged to personally ensure that the matter of Nigeria's AMC to COMSATS is duly taken up during the year 2016. She pledged to circulate the announcements of future capacity-building events of COMSATS among 16 agencies under FMST, as well as other S&T organizations in the country.

Mr. Ansari also called on H.E. Lt. Gen. (R) Agha M. Umer Farooq, High Commissioner of Pakistan, and Mr. Asim Ali Khan, Head of Chancery. His Excellency was briefed about the ongoing programmes and activities of COMSATS, with special reference to its collaboration with Nigeria. The honourable High Commissioner was pleased to learn about the activities of COMSATS and commended its efforts to enhance Nigeria's involvement in its programmes. He pledged to fully support the activities of COMSATS through the High Commission of Pakistan in Abuja, which is also accredited to another Member State of COMSATS, i.e.,

The Permanent Secretary FMST, Nigeria being Briefed about COMSATS' Programmes

Ghana. He informed that the announcement of postgraduate scholarships offered by CIIT was widely circulated in Nigeria, and as a result about 800 students have submitted their online applications to CIIT. He took keen interest in the postgraduate scholarships offered by other Centres of Excellence of COMSATS. Gen. (R) Umer pledged to facilitate in the payment of the Annual Membership Contribution to COMSATS by the Government of Nigeria.

MoU Signed Between COMSATS and SESRIC, Turkey

A Memorandum of Understanding was signed between COMSATS and the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC) on November 9, 2015. The agreement was reached with a view to strengthen linkages between the two organizations for enhancing the cooperation for sustainable socio-economic development of their common Member States.

The specific activities stipulated in the agreement include: organization of workshops, trainings, conferences and seminars in common Member States; sharing of data, publications, documents, studies and statistics relevant to the scientific and economic standings; and execution of joint research studies aimed at assessing the socio-economic needs of the common Member States. The MoU shall be implemented through the development of specific programmes to be jointly executed by the two organizations during 2016-17.

COMSATS' Management Committee Holds its 38th Meeting

The 38th Meeting of the Management Committee of COMSATS was held under the chairmanship of Executive Director COMSATS, Dr. I.E. Qureshi, on 12th November 2015. The Committee meeting was attended by: Mr. Zhang Haihua, the First Secretary (Science and Technology) of the Chinese Embassy in Pakistan; Dr. Haroon Rashid, Pro-Rector COMSATS Institute of Information Technology (CIIT); Mr. Amir Malik, CEO COMSATS Internet Services (CIS); Dr. Tariq-ur-Rahman, former Chairman, Pakistan Council for Science and Technology (PCST); as well as members and senior officials from COMSATS Secretariat, Mr. Tajammul Hussain, Advisor (Programmes), Mr. Sabih-Ur-Rehman, Advisor (Host Country Affairs), Mr. M. Bilal Chouhan, Deputy Director (A&E), and Mr. Amanullah Khattak, Deputy Director (F&A).

The key outcomes of the 3rd General Meeting and the 3rd Consultative Committee Meeting of COMSATS, held in Accra, Ghana (October 26-28, 2015) were the major

The 38th Management Committee Meeting in progress

highlights of Dr. Qureshi's opening remarks at the meeting. The Committee deliberated on various agenda-items, including the implementation status of the decisions of the Committee's previous meeting, and actions taken as a follow-up of the decisions of the 18th Coordinating Council meeting held in Colombo, Sri Lanka, in May 2015. The Management Committee also reviewed the programmes and activities of the Secretariat for the period April to October 2015. Performance, activities and programmes of CIIT and CIS during the said period were also presented before the meeting by Dr. Haroon Rashid and Mr. Amir Malik, respectively. Apart from deliberation on administrative issues pertaining to the Secretariat, the Committee also reviewed the financial matters of COMSATS, including the external audit, Annual Membership Contribution from Member States, and present status of the recently created COMSATS' Endowment Fund. On the occasion, the Executive Director COMSATS made a token contribution of US$ 1,000 towards the Endowment Fund and it was noted that Prof. Dr. Raheel Qamar had also contributed a sum of Rs. 100,000/- during the 18th Coordinating Council Meeting. The Committee resolved to make efforts for ensuring more donations towards the Fund from the Governments of COMSATS' Member States, relevant international organizations, and individual philanthropists.

CIS and ISOC join hands for W4C Project

A Memorandum of Understanding was signed between COMSATS Internet Services (CIS) and the Internet Society (ISOC), on November 20, 2015. Based on the understanding reached under the agreement, both the organizations agreed to collaborate for a pilot-project entitled 'Wireless for Communities' (W4C) at Chak Faiz located near Multan city of Pakistan.

The project is aimed to providing Internet access to underserved rural communities. For this purpose, community empowerment approach would be adopted and Wi-Fi based technologies used.

SPECIAL SECTION: SECOND INT'L WORKSHOP ON 'APPLICATIONS OF ICTs IN EDUCATION, HEALTHCARE AND AGRICULTURE', RABAT

The 2nd International Workshop on 'Applications of ICTs in Education, Healthcare and Agriculture' was successfully held in Rabat, Morocco, on November 23-25, 2015. Hosted by the National Institute of Posts and Telecommunication (INPT), Rabat, the event was jointly organized by COMSATS, the Islamic Educational, Scientific and Cultural Organization (ISESCO) and the Inter-Islamic Network on Information Technology (INIT). The first event of the series was organized in Islamabad, on December 15-16, 2014.

The series of events is aimed at strengthening the capability of software and application developers, researchers and students involved in designing practical applications for addressing development challenges faced by the common Member States in the areas of education, healthcare and agriculture. This series also aims to propose relevant policy measures for improving governance structures in its focus areas.

The inaugural session of the Rabat workshop was held on November 23, 2014, and presided over by Prof. Ahmed Tamtaoui, Director Research INPT. Mr. Abdul Majid Qureshi, Research Scholar at COMSATS, read out a message of the Executive Director COMSATS, while Mr. Attiq-ur-Rehman, Senior Programme Officer at COMSATS Institute of Information Technology (CIIT) read out a message of Mr. Tahir Naeem, Coordinator/Executive Director INIT. Speaking on the occasion, Dr. Ismail AbdelHamid, Science Expert, ISESCO, welcomed the participants on behalf of ISESCO and the organizers. Around 60 subject specialists, researchers and students from 11 countries, including Egypt, the Gambia, Ghana, Iran, Jordan, Morocco, Pakistan, Palestine, Senegal, Sudan, and Uganda, participated in the inaugural function.

The technical proceedings of the workshop spread over six sessions comprised of talks and presentations that introduced applications of ICTs having impact on the management issues related to Health, Education and Agriculture in the developing world. ICTs were presented as a means to secure the future of smaller economies by effective low-cost management of resources, and ensuring efficiency and transparency.

On the first day of the workshop, technical sessions focused on particular applications of ICTs in Healthcare. Some of the main topics deliberated upon were cancer-treatment planning software for clinical electroporation; raising nutritional awareness on the usage of soymilk as an alternative to dairy milk in Sudan; designing a diagnostic support system for mammography; disease monitoring and education management; improving access to healthcare in Uganda using ICTs; vital signs monitoring by video processing on mobile phone; task scheduling in the operating room of the hospital systems; and risk assessment of the healthcare system using the Bayesian network model applications for the operating rooms.

The second day of the workshop was focused on applications of ICTs in Agriculture. The topics of multimedia presentations included real-time monitoring through e-agriculture; MapClim system, early warning mechanism to climate change in Africa; interpretation of data on agriculture in Senegal; use of satellite images for irrigation management; role of telecentres in e-agriculture; agriculture through integration of mobile applications and GPS; communications between agriculture institutes as a tool in the future of agriculture.

The last two sessions of the workshop were devoted to applications of ICTs in Education, and specific presentations included: learning at the basic education level in Ghana; digital management of STEM education service delivery in Gambia; e-learning for the people with disabilities and out-of-school children; Palestinian governmental interoperability framework; education in Iran; and development of learning materials for ICTs in education.

Over 12 international institutions and organizations represented during the workshop included: Iranian Research Organization for Science & Technology (IROST), Iran; Gedaref Digital City Organization, Sudan; Ministry of Higher Education, Research, Science and Technology, Gambia; Council for Scientific and Industrial Research (CSIR), Ghana; National Research Centre (NRC), Egypt; PMAS-Arid Agriculture University, Pakistan; University Alioune Diop of Bambey, Senegal; Royal Scientific Society (RSS), Jordan; Uganda National Council for Science and Technology (UNCST), Uganda; Industrial Research and

Group Photo of the Participants of the Rabat Workshop

Consultancy Centre (IRCC), Sudan; Ministry of Telecommunication and Information Technology, Palestine; Al-Quds University, Palestine; and CIIT, Pakistan.

The workshop had the participation of over 30 students and faculty members of INPT. Furthermore, students and faculty members belonging to various other Moroccan institutions also participated in the event, these included: Mohammadia School of Engineering (EMI), Rabat; Galileo Morocco Group (GIE), Rabat; National School of Mines of the City of Rabat (ENSMR), Rabat; National School of Applied Sciences (ENSAK), Kenitra; National School of IT and Systems Analysis (ENSIAS), Rabat; National Institute of Statistics and Applied Economics (INSEA), Rabat; Université Sidi Mohammed Ben Abdellah, Fez; and National Institute of Agricultural Research (INRA), Rabat.

Banking on the participation and enthusiasm of Masters and Ph.D researchers, an application idea competition entitled 'APPIDEA 2015' was announced on the second day of the workshop. Students from various institutes were invited to actively participate by presenting innovative ideas for developing new applications in the thematic areas of the workshop. Eight presentations were registered for the competition on the final day of the workshop by 13 participants, who were mainly Ph.D students studying in various disciplines at different institutes of Rabat.

The students were mentored by resource persons of the workshop, including Dr. Mubashir Riaz Khan, Pakistan; Dr. Shervin Amiri, Iran; Dr. Redouane Qasrawi, Palestine; Dr. Fidaous Bennis, Morocco; and Dr. Ahmed Eisa, Sudan. This mentoring exercise was meant to simulate a multicultural research environment where students could seek expert advice and get peer review of their work from experts with different national backgrounds. The aim was also to help create greater rapport and coordination between the beneficiaries and resource persons of the workshop so that ideas of potentially useful ICT applications could be developed for the benefit of masses.

A panel of judges evaluated the work based on the significance of the problems identified, the systematic problem-solving approaches used, potential benefits of the application to society; and sustainability of the application and its commercial viability.

The ideas presented during the competition reflected the immense potential of Moroccan students for addressing development and societal problems by applying knowledge gained during the workshop to practical situations. The top two presentations were awarded a cash prize of 500 Moroccan Dirhams during the closing ceremony.

The winning application idea, entitled 'Chno Ndir', was presented by two Ph.D students, Amal Ibn El Hobyb and Fatima Zahra Berrehili. The application was basically about creating a central platform for Moroccan students to get information about job market, skills required, career choices and thus to help high-school students choose the right university education.

The application idea that stood second was entitled 'Intelligent Framework For P-Positioning Safety and Care'. This idea, presented by two Ph.D students from INPT, Ilham Elhandaoui and Mourad Ghafiri, envisaged to help primary care-givers locate Alzheimer's patients suffering from dementia or children having impaired vision. The idea was to incorporate a GPS aided sensing device in the white cane or an application in an enabled cell phone available with the patients. The sensing device would transmit location data to a secure online platform that would keep the primary care-giver/parent informed about the location of the patient.

Two ideas, namely 'Curewell' and 'iSprinkle', presented by Zainab Azough and Imane Khaoujai stood third. According to Ms. Zainab, doctors particularly in remote areas were not connected well to learn about latest developments in medical sciences. The app 'Curewell' aimed at giving the prescriber access to the latest clinical trial data and protocols, while also helping patients find the right doctor for their condition. Similarly, the other application 'iSprinkle' was

Technical Session of the Rabat Workshop in Progress

Winners of the APPIDEA 2015 Competition

Runners up of the APPIDEA 2015 Competition

meant to inform urban farmers about the requirement to water their plants or lawns by calculating soil moisture, air humidity and temperature and helping them remotely trigger watering for their plantations. This would also save water and prevent plant dehydration. Other notable apps presented for the competition were:

- 'Try sharing' – connecting similar research groups and researchers;
- 'Transcription of Arabic handwritten text' – to automate preservation of ancient cultural scriptures;
- 'CC App 2015' – enabling farmers to optimize the bio-composting process;
- 'Souq-al-Falah (the farmer market)' – to enable small farmers, agri-traders and buyers to engage in trade and minimize agricultural losses due to spoiling of produce.

Dr. Ahmed Tamtaoui presided over the closing ceremony of the event held on November 27, 2015. In his closing remarks, he noted that developing countries should support and strengthen their capacities in ICT innovation and diffusion. He thanked the organizers for choosing INPT to host this important workshop and offered his institution's support for similar workshops in future.

Dr. AbdelHamid, in his vote of thanks, appreciated the strenuous efforts of the organizers for making the event successful. He encouraged the participants to give their feedback to further improve the outcomes of the future events of this activity.

On behalf of COMSATS, Mr. Abdul Majid Qureshi gave the concluding remarks, thanking the Ph.D students for their active participation in the workshop and the international speakers for taking out time to share their experiences and expertise.

The event concluded with a ceremony of certificate distribution for the speakers and participants.

Feedback and Comments from some Participants of the Workshop

"The workshop highlighted the role of ICTs in Healthcare, Agriculture and Education. As a Ph.D student, my work focuses on healthcare management and its improvement. This workshop encouraged me to apply ICTs in this domain."

Ms. Imane Khaouja, Ph.D Student, EMI, Morocco

"Thank you for the opportunity. I think every participant must commend COMSATS and other organizers for the workshop."

Mr. William Addo, IT Officer, CSIR, Ghana

"Students should be motivated to conduct research and discuss possible research ideas. … It is my pleasure to be here and know about activities on the subject from around the world."

Dr. Radwan Qasrawi, Researcher, Al-Quds University, Palestine

"It was an excellent event and a good platform for exchange of ideas between participants from different countries. The APPIDEA competition was great."

Ms. Khadija Aouzal, Ph.D Student, INPT, Morocco

"Employing ICT applications is an economic choice, as these help save time and financial resources. The use of ICTs requires motivation and committed experts and should be carefully planned.

Ms. Asma Mustafa, Researcher IRCC, Sudan

"All the presentations were quite useful, similar events with a wider participation are required to sensitize Islamic countries on ICT issues. I hope the next workshop will be held in National Research Centre, Egypt."

Dr. Hani Mehana, Associate Professor, NRC, Egypt

"The workshop was very well organized; in particular the Questions and Answers sessions were very interesting and beneficial."

Prof. Mustapha Amghar, Director, GIE, Morocco

"It was a very good workshop, with enriched learning and diverse topics, with eminent experts from all over the world sharing and discussing great ideas."

Ms. Zainab Azough, Ph.D Student, INPT, Morocco

"… it is very important to have events similar to this workshop".

Ms. Latifa Zhouri, Ph.D Student at INRA, Morocco

S&T INDICATORS OF MEMBER STATE

In Spectrum: Islamic Republic of Iran

Iran has a long history of monarchies dating back to the middle of 6th century B.C. The present-day Islamic Republic of Iran was founded as a result of an Islamic Revolution in 1979. The country has a population of over 81 million (19th largest in the world in terms of population) and a geographic area of about 1,648,000 sq. km (18th largest in the world in terms of area). Iran (formerly Persia) is known to have made significant contributions to the development of science in the pre-modern era. The country produced names like Jabir ibn Hayyan, Muhammad ibn Zakariya Razi, Al-Khwarizmi al-Khati, and Abu Ray an al-Biruni.

Persian is the national language spoken by over 53% of the population, Azeri Turkic and Turkic dialects are spoken by 18%; Kurdish by 10%; Gilaki and Mazandarani by 7%; Luri by 6%; Balochi and Arabic by 2% of the population, respectively (World Fact Book 2015). The country is endowed with natural resources of gas and oil.

The leadership of Iran envisions for the country to become the top knowledge-based economy in the region by achieving self-sustenance, future growth and development through indigenous capacity-building, implementation of a comprehensive scientific plan and innovation strategy.

In 2011, the Iranian President unveiled the country's Comprehensive Scientific Plan, which was drawn up by the Supreme Council of Cultural Revolution and is the country's main plan for long-term sustainable growth in the domain of science. Over 2,000 experts from 800 science and research centres worked together to develop the plan, which includes 224 scientific projects that are to be implemented by the year 2025. Other key actors in Iran's scientific profile include, the Ministry of Science, Research and Technology; the Ministry of Industry and Mines; the Ministry of Agricultural Jahad; the Ministry of Health, Treatment and Medical Education; and the Technology Cooperation Office.

According to the UNDP Report 2015, Iran's Human Development Index (HDI) value for 2014 is 0.766, which falls in the 'high human development' category and positions the country at 69 out of 188 countries and territories. Between 1990 and 2014, Iran's HDI value increased from 0.567 to 0.766, an increase of 35 percent or average annual increase of about 1.26 percent.

Between 1980 and 2014, Iran's life expectancy at birth increased by 24.3 years, mean years of schooling increased by 6.1 years and expected years of schooling increased by 6.4 years. During the same period, Iran's Gross National Income (GNI) per capita increased by about 53 percent.

In the past decade, population growth has slowed from 1.6% per annum in 2000 to 1.1% in 2008, and has been on the rise since and reached 1.3% in 2014 (World Bank 2015). A large population of Iran falls between the ages of 20-40, which can be an asset for the country's development, provided that high rates of unemployment are checked.

According to the UNESCO Institute for Statistics, Iran devoted 5.1 billion Rials to R&D in 2002, 8.3 billion in 2004, and 13.7 billion in 2006. Meanwhile, Gross Expenditure on R&D (GERD) rose to 41% in 2004, 64% in 2005 and 65% in 2006. This translates into a GERD/GDP ratio of 0.67% in 2006, compared to 0.55% seven years earlier. More than 61% of GERD is provided by the government, the remainder comes from business enterprises (30.9%) and higher education sector (7.4%). Interestingly, the contribution of business R&D has declined somewhat in recent years, in favour of the higher education sector.

According to the World Factbook 2014 estimates, the services sector contributes the largest share of 53.1% to the GDP, followed by industrial sector (37.7%), and agriculture

Selected Development Indicators for Iran

Indicators	1990	2000	2014 *(*or latest available)*
Merchandise trade (% of GDP)	34.15	42.1	33.1
High-tech exports (current million US$)	-	12.3	652.5*
High-tech exports (% of manufactured exports)	-	0.6	4.1*
Mobile cellular subscriptions (per 100 people)	-	1.5	88
Health expenditure per capita (current US$)	-	231	432
School enrollment, secondary (% gross)	52.7	78.7	86.2*
School enrollment, tertiary (% gross)	-	19.19	57.9*
Patent applications, nonresidents	173	206	338
Patent applications, residents	182	410	11,305
Scientific and technical journal articles	94	841	8,175*

Source: *The World Bank's Development Indicators, December 2015*

Iran's HDI Trends based on Consistent Time-Series Data					
Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2005 PPP$)	HDI value
1980	51.1	8.7	2.1	7,226	0.443
1985	50.1	8.7	2.8	7,210	0.46
1990	61.8	9.2	3.8	6,189	0.54
1995	68.2	11.2	5	6,674	0.618
2000	69.8	11.9	6	7,507	0.654
2005	71.3	11.5	7	9,060	0.685
2010	72.7	14.4	7.8	10,834	0.74
2014	75.4	15.1	8.2	15,440	0.766

Source: *UNDP, Human Development Report 2015*

sector (9.2%). However, economic activity and government revenues to a large extent still depend on the country's oil revenues, as the country ranks 2nd for largest proven gas reserves and 4th for proven oil reserves. This dependence makes the economy volatile.

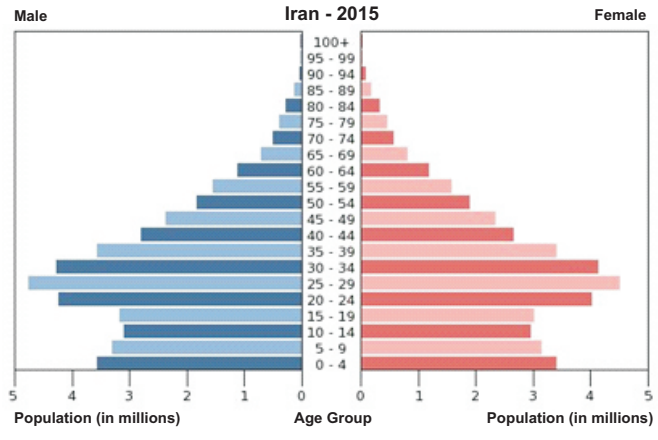
Diversification is imperative for the Iranian economy not only because natural resources become more accessible but also because export success in world markets increasingly demands knowledge-intensive production and innovation-based competition. Above all, there is a need to provide quality jobs for 800,000 skilled work force that enters the labour market every year. Iran has successively built capacity in several emerging technologies and can rightly be considered the regional hub in Nanotechnology.

According to the World Science Report 2010, compared to other middle-income countries, Iran and Malaysia have relatively higher number of science and technology Master's or doctoral graduates.

For the past 30 years, Iran has been expanding its university admission capacity. By the turn of the century, Iranian universities had a capacity of about 160,000 students. By 2009, this number had risen to 1,500,000 students. At the graduate level, the increase has been nearly as spectacular; 10,000 graduates in 2000 and 81,000 in 2009.

An analysis of the two World Science Reports 2010 and 2015 reveals that Iran has resorted to intensifying resource-allocation towards a knowledge-based economy which the report refers to as the 'Sanction push'.

The shift towards a knowledge-based economy will require creating a national innovation system based on science and technology that would not only transfer ready-made technologies, but also to engage in re-invention, developing new technologies and diffusing them throughout the economy. There is a need to better link the science and technology infrastructure to the needs of the productive sector, in general, and building capabilities in high technology areas, in particular.



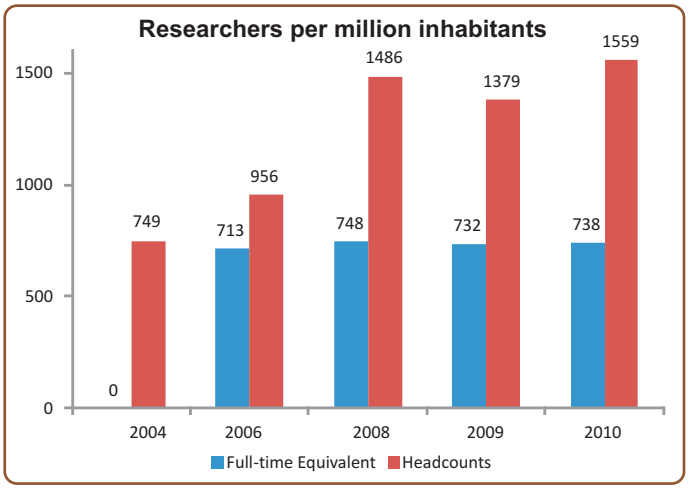
Population Pyramid of Iran

Note: *A population pyramid draws an age vs. gender comparison structure of a country's population and provides insights and projections regarding its socio-economic development.*

KEY TARGETS FOR IRAN

- Raise the GERD/GDP ratio to 3% by 2015 and to 4% by 2025;
- Carry business expenditure on R&D to 50% of GERD by 2025;
- Raise the share of researchers employed by the business enterprise sector to 40% by 2025;
- Increase the number of full-time university professors per million population from 1,171 in 2013 to 2 000 in 2025;
- Raise FDI to 3% of GDP by 2015;
- Privatize 80% of state-owned firms between 2004;
- Publish 800 scientific articles in international journals per million population by 2025, compared to 239 in 2013.

Source: *World Science Report 2015, UNESCO*



ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

Distinctions for al-Farabi Kazakh National University-Kazakhstan

Six scientists of al-Farabi Kazakh National University, Kazakhstan have been awarded the State al-Farabi Award of 2015 in the field of Science and Technology by the President of the Republic of Kazakhstan, H.E. Nursultan Nazarbayev. The awards are given out once every two years and are regarded as Kazakhstan's highest recognition of merit in the field of Science and Technology.

Six scientists from KazNU received the award for their collective research work on 'Quantum and Collective Properties of Plasma: Theoretical Bases of New Technologies'. The awardees belonging to the University's Research Institute of Experimental and Theoretical Physics are: Tlekkabul Ramazanov, Maratbek Gabdullin, Karlygash Dzhumagulova, Merlan Dosbolayev, Sandugash Kodanova, and Tolegen Kozhamkulov. The researchers' work has fundamental as well as applied character that can help promote development of energy saving technologies.

State al-Farabi Award 2015 Recipients from KazNU, Kazakhstan

According to the National Ranking of Kazakhstan, KazNU has been recognized as the 'Best Multidisciplinary Higher Education Institution' in 2015. The final evaluation results for KazNU are 98 out of 100 possible points. The rating is based on the amount of points under three criteria: effectiveness of higher education institution's performance; expert evaluation; and reputation among employers. In the Republic of Kazakhstan, the rating is one of the most important elements of the National System of Education Quality Assessment (NSEQA), which is mentioned in the State Programme of Education Development in the Republic of Kazakhstan for 2011 -2020.

KazNU-Kazakhstan Establishes a New Medical Department

KazNU-Kazakhstan has established a new Medical Department – the Higher School of Public Health Care (HSPHC), which is the fifteenth faculty of KazNU. The School is at par with international standards and would cater to education of medical personnel at many levels, including a bachelors degree, magistracy, residency and doctoral studies. Additionally, professional education would also be provided to representatives of business enterprises and experts of various spheres and sectors engaged in development, and implementation of programmes for improvement and preservation of health.

Office of the Museums Association of Pakistan (MAP) Inaugurated at CIIT-Pakistan

Newly established Office of Museums Association of Pakistan (MAP) was inaugurated at COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan, on 10th of December, 2015. The Finnish Roving Ambassador to Pakistan, H.E. Rauli Suikkanen, inaugurated the Office located in the Islamabad Campus of the Institute.

CIIT is the patron of Museums Association of Pakistan, a body of Museums and related professionals of Pakistan. CIIT Sahiwal is playing a key role in development of Museums and Museology in Pakistan. MAP offices have been established at CIIT's Sahiwal, Islamabad and Lahore campuses. Earlier in 2014, the Finnish Museums Association (FMA) and Museums Association of Pakistan (MAP) had signed a Memorandum of Understanding, as a result of which Montgomery Museum and the Department of Heritage Studies at CIIT, Sahiwal Campus, were established.

Awards and Recognitions for CIIT-Pakistan

A team of students from CIIT-Pakistan won the poster competition at the 6th Annual Public Health Scientific Conference, held at the Health Services Academy, Ministry of National Health Services, Islamabad. The event was jointly organized by WHO, UNICEF, UNFPA, Ipas Health Access Rights and Palladium. The team won the award for their poster, titled 'Metallo Beta Lactamase in Hospital Setting: Molecular Surveillance'. The winning work was one out of over 150 posters presented under the theme of "Fragile Health System: Issues and Challenges in Pakistan – Harnessing Opportunities".

Another honour for CIIT came with Dr. Muhammad Shahbaz, Associate Professor CIIT, achieving 200 Impact Factor publications and 2nd position among top 200 young economists of the world. An award presenting ceremony in

recognition of his achievements was organized on 20th November 2015.

Ms. Izza Afridi, student at the Department of Development Studies, CIIT Abbottabad Campus, won 2nd position in the "All Pakistan Great Debate Competition". The event was organized by the British High Commission in Islamabad. She won a cash prize of £1,000.

Activities at IRCC-Sudan

The Industrial Research and Consultancy Centre (IRCC), Sudan, organized a training course on 'Patents and their Importance in Scientific Research' from 2nd to 4th November 2015. Organized in collaboration with Federation of Arabic Scientific Research Councils (FASRC), the course was attended by a group of university professors, as well as representatives of scientific research centres in Sudan.

From 15th November to 30th December 2015, IRCC organized an integrated programme for 'Leadership Training', in collaboration with Asakinah Training Center, Khartoum. The training programme was focused on training mid-level managers of IRCC, and had the participation of 20 researchers.

During the reporting period, scientists from IRCC also participated in the following events:

- 2nd International Workshop on 'Applications of ICTs in Education, Healthcare and Agriculture', Rabat, Morocco (23-25 November 2015);
- UNIDO Training course on green industry and sustainable energy solutions, Manama, Bahrain (24 November to 1 December 2015); and
- SIRIM Training course on fostering innovation for organizational sustainability, Berhad, Malaysia (29 November to 13 December 2015).

RSS-Jordan Conducts Training Course on Green Buildings

The Royal Science Society (RSS), Jordan, conducted a 3-day training course on 'Green Buildings', on November 8-10, 2015. The training course focused on 'Jordanian Green Buildings Guide Manual', the sole reference for green buildings in Jordan.

Participants of RSS' Training Course on Green Buildings

Since early 1980s, RSS has been preparing, developing and upgrading the national building codes and guide manuals for the Ministry of Public Works and Housing of the Jordanian National Building Council. These codes and manuals contain the unified scientific basic requirements and measures that regulate and govern the engineering construction projects in Jordan with special focus on water and energy saving techniques, and environment friendly best practices. The most recent guide is "the Jordanian Green Buildings Guide Manual".

The aim of this pioneering course was to encourage constructing sustainable, healthy and eco-friendly buildings with high efficiency and reasonable costs; optimize energy and water use; and stop the ongoing depletion of natural resources. The course introduced the contents of the Jordanian Green Buildings Guide Manual to Jordanian engineers in order to enable them to use and implement technical standards in the domain of green buildings.

Participants of the training course represented public and private sector institutions of Sudan, including Aqaba Special Economic Zone Authority, Housing & Urban Planning Development Institution, Jordanian Construction Contractors Association, Izzat Marji Group, Tala Bay Aqaba project, the Higher Council for Science and Technology (HCST), and Dar Al Omran.

According to Engr. Bassem Ta'an, Director of Construction & Sustainable Building Center (CSBC), RSS, the society is to play a big role in strengthening the green building concept. He also added that RSS started to construct a new building for the National Energy Research Center (NERC) in its premises in accordance with the Jordanian Green Buildings Guide Manual.

TUBITAK MAM-Turkey organizes International Training Workshop on Sewage Treatment by Natural Processes

The Environment & Cleaner Production Institute (ECPI) of TÜBİTAK Marmara Research Center (MAM), Turkey, in collaboraton with the Inter-Islamic Network on Water Resources Development & Management (INWRDAM) organized the International Training Workshop on 'Sewage Treatment by Natural Processes; Constructed Wetlands' at Gebze, Kocaeli, Turkey, on December 14-18, 2015.

A Speaker of TUBITAK MAM Workshop on Sewage Treatment

The workshop was funded by the Islamic Development Bank (IDB). It resulted in deliberations on treatment of household sewage by constructing wetlands, and knowledge-transfer and networking in related issues. Scientists, researchers and administrators from TUBITAK MAM ECPI; Pakistan Council of Research in Water Resources; Department of Irrigation and Drainage; Malaysian Ministry of Water Resources, and relevant institutions from Bangladesh, Iraq, Tunisia, and Uzbekistan, participated in the workshop. Local participants belonged to Istanbul Technical University, Namik Kemal University, the General Directorate of State Hydraulic Works, City of Kocaeli Department of Water Supply and Sanitation, City of Istanbul Department of Water Supply and Sanitation, City of Sakarya Department of Water Supply and Sanitation, and TURMEPA NGO.

Opening speeches of the event were given by Dr. Murad Jabay Bino, Executive Director of INWRDAM, Assoc. Prof. Kemal Gunes, INWRDAM Turkey Focal Point and Dr. Selma Ayaz, Deputy Director of TUBITAK MAM ECPI. A representative of TUBITAK MAM ECPI made a presentation on research projects on water resources by its researchers.

Academicians from Istanbul Technical University and Namık Kemal University highlighted the issues and approaches on integrated watershed management and modelling in constructed wetlands.

A field trip was also organized to Gebze wastewater treatment plant, Balcik village constructed wetland and water treatment plant in Denizli Village, Gebze.

ITI-Sri Lanka Scientists win Presidential Awards for Scientific Publications

On 18th November 2015, Dr. G. A. S. Premakumara, Dr. P. N. R. J. Amunugoda, Dr. R. M. Dharmadasa and Mr. Kosala Samarasinghe of Industrial Technology Institute (ITI), Sri Lanka, received the Presidential Awards for Scientific Publications 2013.

Dr. G. A. S. Premakumara receiving the Presidential Award

Organized by National Research Council, Sri Lanka, these awards recognize Sri Lankan scientists for reaching high standards in research, and publications in reputed international journals.

ITI-Sri Lanka Organizes Biennial Research Symposium (2015)

ITI, Sri Lanka, held the 2nd Biennial Research Symposium on 16th November 2015 in Colombo. The event, bearing the theme 'Science, Technology and Innovations for a Knowledge-based Economy', encouraged knowledge-sharing among ITI researchers and scientists. During the Symposium, important discussions were held on issues related to S&T and its impact on the economy of Sri Lanka.

The Honourable Sri Lankan Minister of Science, Technology and Research, Mr. Susil Premajayantha, graced the occasion as the Chief Guest. The Chairman, ITI, Mr. Niroshana Perera, welcomed the distinguished guests, invitees and the researchers.

The recently re-appointed Director General, ITI, Dr. G.A.S. Premakumara, highlighted the role of his institute and the importance of the symposium. A keynote address was delivered by Mr. W. A. Wijewardena, former Deputy Governor of Central Bank of Sri Lanka.

BCSIR-Bangladesh Scientist wins Early Career Chemists Award

Dr. Mohammad Nazrul Islam Bhuiyan, Senior Scientific Officer of BCSIR Laboratories, Chittagong, received 'Early Career Chemists' Award'.

The award was given during the 2015 International Chemical Congress of Pacific Basin Societies (PAC CHEM™) that took place in Honolulu, Hawaii, on December 15-20, 2015.

OPINION: ROLE OF INTELLECTUAL PROPERTY IN PROMOTING INNOVATION: FROM THE PERSPECTIVE OF DEVELOPING COUNTRIES

Nefissa Chakroun*

This article focuses on the relationship between intellectual property regulations and innovation. More specifically, it attempts to shed light on the role played by intellectual property regulations in promoting innovation from the perspective of developing countries. In this respect, it argues that, contrary to what is commonly believed, adopting intellectual property regulations does not suffice to promote innovation. In the exposition of this argument, the article starts by offering some definitional clarifications before examining how intellectual property regulations alone fall short to boost innovation.

A. Clarifications Issues

The Organisation for Economic Cooperation and Development (OECD) considers that innovation goes 'far beyond the confines of research labs to users, suppliers and consumers everywhere - in government, business and non-profit organisations, across borders, across sectors, and across institutions'[1]. Four types of innovation can be defined, the product, the process, the marketing and the organizational innovation[2]. Hence, while innovation is the act of bringing inventions, namely new products and or new processes, to the market, intellectual property regulations are a set of rules allowing transformation of the inventions into intellectual property assets. Precisely, intellectual property laws are meant to govern the acquisitions, the maintaining in force, and the exploitation of intellectual property assets. These regulations are contained in international conventions, such as the Berne Convention for the Protection of Literary and Artistic Works (September 9, 1886), and Paris Convention for the Protection of Industrial Property (March 20, 1883). Apart from the international instruments, intellectual property regulations are mainly taken at national levels as issuing patent of invention, for example, remains an eminently strategic issue.

There exists a general misperception that it is sufficient to pass laws and bills regulating all aspects of intellectual property to promote innovation. Therefore, the vast majority of developing countries are engaging in upgrading their domestic intellectual property legal frameworks to meet the international standards. For example, in 1999 and 2000, the Tunisian government made considerable efforts to overhaul its intellectual property legal frameworks to bring it up to the standards set out by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)[3], and so did the vast majority of the member countries of the World Trade Organization.

This endeavour did not cover the upgrading process but it extended to cover other aspects, like the ratification of the major, if not all, the international conventions related to intellectual property rights. If one looks at the number of developing countries that have ratified the Patent Cooperation Treaty (PET), one will find that almost all developing countries have done so. Similarly, if one looks at the number of developing countries that ratified the Protocol relating to the Madrid Agreement Concerning the International Registration of Marks, one will find that a great number of them have done so. Overall, assessing the legal frameworks regulating intellectual property aspects in developing countries would necessarily lead to the conclusion that these countries have complete intellectual property regimes offering a comprehensive protection for intellectual property rights. It is thus obvious that having such legal frameworks would not necessarily promote innovation.

B. Intellectual Property Regulations and the Innovation Ecosystem

Commenting on this issue, the Director General of the World Intellectual Property Organisation (WIPO) said,'intellectual property is an essential but not sufficient condition or component of a healthy innovation ecosystem. However, the way in which it operates to support innovation is complex and it does vary across technologies and different forms of intellectual property.'[4] This leads us to the conclusion that if developing countries are missing out on innovation, it is not because they are lacking regulations protecting their intellectual property rights, but because there are some relevant elements of the innovation ecosystem that are missing or not properly implemented. These elements can be related mainly to the following aspects:

Governmental Funding for Research Activities

A viable innovation ecosystem implies the implication of the government to fund and support research activities. This is a well-established policy in all countries where economies are driven by strong research activities. According to the OECD estimations, recovery trends of Gross Domestic Expenditures on R&D (GERD) have been observed in 2012. As a result, the level of R&D spending rose by 2.7% in real terms from 2011 to 2014. This evolution has been driven by a robust recovery in

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R&D performed by businesses (+3.5%), well in excess of subdued growth of R&D expenditures in higher education institutions (+1.4%) and in the government sectors (+0.9%)[5]. By way of comparison, developing countries allocated 0.43% (Egypt), 0.03% (Iraq) 0.09% (Kuwait), 1.07% (Malaysia), 0.33% (Pakistan) of their GDPs in 2012[6]. It goes without saying that without a substantial governmental financial support to research and development activities of universities and research centres, the intellectual property system will not produce the desired results.

Strategy for the Development of Research and Development Programmes

A sustainable innovation ecosystem necessitates funds but not only that. A strategy is needed to identify the research programme priorities and the areas of technology, where a given country should allocate a substantial part of its resources.

Support for Competitive Market Forces and Firm Actions

An intellectual property system cannot thrive without a competitive market environment. Governments generally support R&D activities of universities and public research centres, however they should also encourage the private-sector to undertake R&D activities. This could be done by providing direct funding for R&D through grants and contracts. In this regard, several OECD countries are providing tax-based incentives to entice businesses to invest in R&D. Most recently, some of these countries have re-oriented resources away from budget-based direct funding of R&D to providing tax relief for R&D costs[7].

Innovation Skills and Profiles

As noted earlier, setting up an intellectual property system is quite often confused with adopting legal frameworks and passing regulations into laws. A vast majority of developing countries have adopted legal frameworks for regulating and protecting all kinds of the creations of minds. But in many ways, they have overlooked an important factor which is related to the development of skills and profiles specialized in intellectual property. Such profiles, for example, are related to the drafting of patent applications. Another very important profile is related to the patent search activity. Valuation of patents is also a crucial profile. Other aspects of the intellectual property system need special profiles, such as those relating to copyright, trademarks and industrial designs.

Partnerships with All Stakeholders Involved in Knowledge Creation and Dissemination

Open innovation and knowledge exchange can be good illustrations for promoting innovation. Collaborations between academia and the productive sector are essential. The problem is that in several developing countries, where there is no tradition of building up such collaborations, quite often these partnerships, when they exist, are not regulated. In practical terms, there are no joint research agreements that regulate the intellectual property rights of each party. In the absence of such legal frameworks, no intellectual property assets can be generated by these collaborations. Therefore, even though developing countries have adopted the necessary laws to promote intellectual property rights, in practice there is room for implementing these laws. In other words, there is no point for a country to be part of the Patent Cooperation Treaty if there is no submission of patent applications, for which protection can be extended to other countries. If developing countries are not innovating, it is because the general environment is not favouring innovation. This would happen only with the combination of all factors from research skills to funding issues and intellectual property skills. Amalgamating all these factors would lead to innovation.

C. Conclusions

Developing countries have been converting regulations into laws to promote intellectual property rights and to be in compliance with international standards set out by the World Trade Organization and by the World Intellectual Property Organization. This is a notable endeavour but not sufficient to boost innovation. A knowledge-based economy requires setting up a comprehensive innovation ecosystem that starts by instilling the intellectual property system to the engineers and lawyers, who are responsible for its implementation at the national and international levels.

Reference Notes

1. OECD Innovation Strategy - An Agenda for Policy Action, 2015.
2. The product innovation is 'a good or a service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.' The process innovation is 'a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software'. The marketing innovation is 'a new marketing method involving significant changes in product design or packing, product placement, product promotion or pricing'. The organizational innovation is 'a new organizational method practices, workplace organization or external relations.'
3. Tunisian laws regulating the industrial property rights as amended in accordance with TRIPS agreement. <http://www.innorpi.tn/Fra/la-propriete-industrielle_11_64>, accessed on 16 November 2015.
4. Noted by D.G. IPO at the launch of the 2015 World Intellectual Property Report, Geneva, 2015.
5. OECD estimates of R&D expenditure in R&D in 2012, available at <http://www.oecd.org/sti/inno/Note_MSTI2013_2.pdf> dated January 2014 and accessed 16 November 2015.
6. OECD, Research and Development Expenditure (% of GDP) available at <http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS> Accessed 16 November 2015.
7. OECD, Measuring R&D Tax incentives available at <http://www.oecd.org/sti/rd-tax-stats.htm> accessed 16 November 2015.

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Male Malaria Mosquito Engineered to Introduce Infertility in Progeny

Researchers at the Imperial College London, UK, have produced the first ever male mosquito, with genes using the CRISPR-Cas9 gene drive system that cause infertility in female progeny by disrupting their reproductive system. Scientists hope to use this method along with the traditional methods (e.g., draining standing water, spraying and using nets) in order to drastically reduce the mosquito population which is responsible for transmitting malaria. Gene drives are in use to control invasive species like mosquitos or eliminate traits like pesticide resistance, and are also used for stimulating biased inheritance of particular genes to alter entire populations.

Trials on the *Anopheles gambiae*, the species that dominates among the malarial vectors in Sub-saharan Africa, revealed that the gene was transmitted to more than 90 percent of the progeny, as opposed to the normal 50 percent rate for non-dominant genes. The research was published in *Nature Biotechnology* on 7th December 2015 and holds immense potential for cutting down malarial vector species; however the cost of using the technology on a large scale is still debatable.

Tech Giants Resist Weakening of Encryption

According to a report published by Samuel Gibbs in *The Guardian* on November 23, 2015, Apple, Microsoft, Google, Samsung, Twitter, Facebook and 56 other technology companies have joined together to reject calls for weakening encryption saying it would be “exploited by the bad guys”. End-to-end encrypted communications mean that only the sender and receiver can view the contents of the message, which, governments say, has put intelligence services at a disadvantage.

After the Paris Attacks, debate has erupted over which sort of communication requires ‘Encryption’, the bedrock of the Internet used by almost every transmission. The important question is whether technology companies should refuse to include means through which governments and security agencies can break encryption, because banning encryption would only impact the lawful as it will be very hard to stop terrorists from using software that uses encryption, says the report. *(Courtesy of Guardian News & Media Ltd)*

Lychee at the Root of Death in Malnourished Children

The *SciDev.Net’s* South Asia desk reports that a team of researchers, investigating mysterious death of children in Muzaffarpur, Bihar, India, well known for commercial production of Lychee, revealed that the children had low blood sugar signaling some form of metabolic disease. On the request of the Indian Ministry of Health and Family Welfare in 2013, researchers began investigating into the virus that may have caused hypoglycaemic encephalopathy in the deceased. However, when no virus was dectected a team of virologists led by T. Jacob John, began suspecting a toxin from pesticides or from lychee fruit.

Investigations showed that methylene cyclopropyl-glycine (MCPG) was present in lychee fruit. The findings were published in *Current Science* (25th December 2015). MCPG is akin to another toxin found in ackee (*Blighia sapida*), a West Indian fruit. Both lychee and ackee come from the *Sapindaceae* (soapberry) family of plants. MCPG is known to cause hypoglycaemic encephalopathy, a metabolic illness that affects the brain when body sugar levels are low due to fasting or undernourishment. MCPG forms compounds with carnitine and coenzyme-A, making them less available for important metabolic reactions in the body. The toxin is seen in high concentrations in the seed and semi-ripe pulp of the fruit.

Current Climate Models Misrepresent El Niño

An analysis of fossil corals and mollusc shells from the Pacific Ocean by Julien Emile-Geay, Assistant Professor of Earth Sciences at the USC Dornsife College of Letters, Arts and Sciences (USA), and her colleagues revealed that there is no link between the strength of seasonal differences and El Niño. El Niño is a complex but irregular climate pattern with large impacts on weather, agriculture, fisheries, tourism, and air quality worldwide. The results that were published in *Nature Geoscience* analyzed 60 specimens from various locations of the Pacific Ocean to reconstruct weather patterns in tropical pacific. Shells were chosen for the study as they form by crystalizing calcium carbonate from the surrounding water and record information on temperature, and salinity changes. They also capture the prevalence of various isotopes of oxygen, which vary based on sea-surface temperature.

The finding which explains the phenomenon over at least 10,000 years contradicts the top climate models in use today, which associate exceptionally hot summers and cold winters with weak El Niños, and vice versa. The weather snapshot constructed through the analysis of shells was compared with the predictions of nine state-of-the-art climate models, giving a clear mismatch from the predicted models. The models generally failed to simulate lengthy periods of subdued El Niños, like the one that occurred 3,000 to 5,000 years ago.

Emile-Geay hoped that his findings will be used to refine climate models further, making them even more accurate, says a report published in *Science Daily* on December 15, 2015.

PROFILE OF HEAD OF COMSATS' S&T CENTRE OF EXCELLENCE

PROF. DR. AHMED GHRABI, DIRECTOR GENERAL CERTE, TUNISIA

Prof. Dr. Ahmed Ghrabi is the incumbent Director General of the Water Research and Technologies Centre (CERTE), Tunisia, and also heads its Wastewater Treatment Laboratory (WTL). CERTE became a member of COMSATS' Network of Centres of Excellence in May 2014.

Prof. Ghrabi did his Baccalaureate in Sciences in 1975, and later obtained a number of high university engineering diplomas: Scientific Studies Diploma from Faculty of Sciences, Tunisia (1978); Rural Engineer Diploma from National Institute of Agronomy, Tunisia (INAT) in 1980; Sanitary Engineer Diploma from National School of Public Health at Rennes, France (1981); and Specialized Diploma on Water, Rural and Forest Engineer from INAT (1983). He acquired his Ph.D. in 1994 from the University of Montpellier-II, France, and later in 2001, obtained Habilitation to Supervise the Research (HDR) from INAT, Tunisia.

Prof. Ghrabi started his career in March 1983 as Chief Engineer (Sanitary Engineering) with the National Institute of Scientific and Technical Research (INRST), Tunisia. He also served INRST in the capacities of Higher Education Assistant (1985-1990) and Assistant Professor for Sanitary Engineering (1990-2002), to later serve CERTE as Professor of Higher Education in Sanitary Engineering (2007 onwards).

As a researcher, Prof. Ghrabi has been conducting studies on wastewater treatment, recycling and local water management since 1980. His work is focused on wastewater stabilization ponds, constructed wetlands, rainwater harvesting and recycling, and pollution evaluation and monitoring.

As an expert/administrator in the field of Sanitary Engineering Prof. Ghrabi has been rendering services as technical reviewer to the Tunisian Government for the evaluation of public-sector projects. He has also been contributing to a number of bilateral and multilateral research projects as coordinator/member or leader, including:

- Microbiological Examination of Water Treated by Fluorescent Semiconductor Nano-crystals (Tunisian-French cooperation) [2014 to 2016];
- Capacity-building Programme on 'Water Integrity in the Middle East and North Africa' (MENA-WI) (Tunisian-Swedish Cooperation) [2014 to 2017];
- Integrated Action for Scientific and Institutional Strengthening of Treatment and Reuse of Wastewater in Small Towns (Tunisian-Spanish cooperation) [January to December 2013];
- Fostering Partnerships for the Implementation of Best Available Technologies for Water Treatment & Management in the Mediterranean (EU-FP7) [September 2013 to August 2016];
- Mediterranean Science, Policy, Research & Innovation Gateway (MED-SPRING) (FP7- INCO.2012-1.3/Mediterranean Partner Countries) [2013 to 2017];
- Sustainable Domestic Water Use in Regions of the Mediterranean SWMED (European Union: ENPI Programme CBCMED) [2012 to 2015];
- Capacity-building for Reuse with Live Mediterranean Area (CB-WR-MED) [May 2010 to April 2013]; and
- Sustainable Concepts Towards a Zero Outflow Municipality, under Euro-Mediterranean Programme for Local Water Management: MEDA Water Programme [2003 to 2009];

As an academician, Prof. Ghrabi is actively engaged in teaching and research assignments at the National Institute of Agronomy, Tunisia. He is currently supervising 6 Ph.D. dissertations and has supervised a number of students at the doctoral, masters and engineering diploma levels, including five Ph.Ds. He is also serving as International Collaborative Researcher to the Alliance for Research on North Africa (ARENA), established at the University of Tsukuba, Japan.

Prof. Dr. Ahmed Ghrabi has more than 60 scientific papers published in international journals and presented more than 100 oral lectures in international scientific events. He is a scientific reviewer and member of editorial boards of several scientific journals. He is a member of several scientific committees of national and international scientific events, and has actively contributed to organizing a number of international conferences, workshops and training sessions in his areas of specialization.

Prof. Ghrabi has been a member of International Water Association (IWA) since 1994, and Scientific and Technical Association for Water and Environment (ASTTE, France) since 2003. He is also a Founding Member of the Association 'La Recherche en Action (REACT) Tunisia.

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COMSATS' BRIEF AND ANNOUNCEMENTS

Selected Forthcoming Scientific Events in COMSATS' Countries

05-06 April 2016	2nd IT Showcase Pakistan, Karachi, Pakistan *(www.itshowcasepakistan.com)*
05-07 April 2016	7th International Conference on Information and Communication Systems (ICICS 2016), Irbid, Jordan *(www.icics.info/icics2016)*
13-14 May 2016	5th International Conference on Informatics, Electronics & Vision (ICIEV), Dhaka, Bangladesh *(cennser.org/ICIEV)*
16-19 May 2016	16th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing, Cartagena, Colombia *(ccgrid2016.uniandes.edu.co)*

19th Coordinating Council Meeting 17-18 May 2016, Islamabad, Pakistan

COMSATS is holding 19th Meeting of its Coordinating Council in Islamabad, Pakistan, on 17th & 18th May 2016, which will be co-hosted by COMSATS Institute of Information Technology (CIIT). The annual meetings of the Council deliberate, inter alia, on matters pertaining to the activities of COMSATS' Network of Centres of Excellence; follow-up on the decisions and recommendations made in its last meeting; and future course of action for the organization's technical programmes.

For more information on the Council meeting, the members or their representatives may contact Mr. Tajammul Hussain, Advisor (Programmes) COMSATS, over his email (husseint@comsats.net.pk).

Scholarships offered by the COMSATS' Centres of Excellence for Member States

COMSATS Institute of Information Technology (CIIT), Pakistan, offers 100 scholarships for students/researchers for post-graduate studies in all disciplines offered by the university at its 7 campuses, as well as five post-doctoral fellowships.

The Iranian Research Organization for Science and Technology (IROST), Iran, offers 7 Ph.D scholarships [4 fully paid and 3 partially paid (50%)] and five-post-doctoral fellowships in disciplines offered by the Organization.

The International Center for Chemical and Biological Science (ICCBS), Pakistan, offers scholarships for MS and Ph.D studies in disciplines offered by the Center.

For more details, please write to Mr. Tajammul Hussain, Advisor-Programmes, COMSATS Headquarters at **hussient@comsats.net.pk**.

Science Vision - Call for Papers

COMSATS invites scholarly contribution for Volume 21 of its bi-annual journal Science Vision, which aims at highlighting the important scientific and technological developments that have a bearing on socio-economic conditions of the people.

For more information, 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 23 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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