COMSATS Newsletter

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

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Participants of the Second Lecture under COMSATS' Science Diplomacy Programme, Islamabad, Pakistan (February 29, 2016)

Inside this Issue

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

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From the Executive Director's Desk

With much fanfare and bonhomie the world leaders signed on to new global Sustainable Development Goals (SDG) in a summit during the 70th session of the UN General Assembly held in September 2015, in New York, USA. The 17 goals and 169 targets of SDG are supposed to guide the development agendas across the globe and 'transform' our world by 2030. Will it be so? Will the targets be achieved fully? The answer begs for a realistic assessment rather than good wishes and sincere hopes. The SDG declaration[1] itself considers that the Goals are based on an 'extremely ambitious' and 'transformational' vision. The dilemma here is that setting out Goals that are not considerably ambitious run the risk of not getting enough enthusiastic response, while too ambitious targets are doomed to remain under-achieved leading to increased sense of despair.

For the first fifteen years of the present millennium, the world has been engaged in achieving Millennium Development Goals (MDG). The results obtained in this respect can serve as a good yardstick to guage what the next fifteen years will be holding in store. Surely, the absence of any global development vision would have resulted in much less progress than has been achieved with respect to MDG. However, the single most significant lesson learnt at the end of that exercise was that success is always partial and highly variable both within the targets and across the nations. In short, the Goal such as: 'End poverty in all its forms everywhere' (SDG 1), is too general and too optimistic. May be, in the end, poverty will be reduced within percentages of, say, 50%-80%, for countries within the range of, say, 80%-90%. That is how the mathematics of economic disparities works and that is how the outcome is likely to be. Currently, according to OXFAM[2] report, there are 1% of people in the world whose accumulated wealth is equivalent to what the rest of 99% have. Another disparity estimate by OXFAM shows that only 62 richest persons own as much wealth as 50% poorest people of the world have. That translates into each of the 62 persons on average having more than the possessions of 56 million poor souls. Man-made interventions

notwithstanding, there are always unavoidable factors leading to temporal variability of any ongoing socio-economic process. Factors beyond the control of financial managers, such as outbreak of disease, war or national catastrophes can eliminate the gains or halt the progress. Yet, it is necessary to aim high and have faith in human ability.

The SDG 2 envisages to: 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture'. The United Nations Food and Agriculture Organization (FAO)[3] estimates that there are about 800 million humans who can be categorized as 'hungry', i.e., not having enough of anything to eat. There could be more if malnutrition and undernourishment are also taken into account. There is no doubt that enough money is available to banish hunger from the world, if there is a will to do so; a will to change the prevailing ethos of corporate profitability and a mindset of amassing wealth. It is estimated that about US $30 B will be required annually for the next 15 years to achieve the first part of SDG 2. This is a paltry amount when contrasted with other spending heads. For example, US News[4] has quoted figures from US Bureau of Labor Statistics, indicating that the American public spends US $60 B annually on pet foods. Another glaring example of misplaced priorities is the military expenditure world-wide. The SIPRI[5] data shows that the total military budget of the world was US $1,776 B during 2014. This figure means that only about six days' military expenditure cut per annum is all that is required to eradicate the scourge of hunger.

The additional 15 Goals, if achieved in their totality, will turn the world into a utopian island. To believe that this will actually happen, one requires a gargantuan amount of optimism, considering the perils of global vulnerabilities in terms of unbridled capitalism, adverse climatic changes, increasing military conflicts, dwindling energy sources, diminishing fresh water availability and worsening inequalities. If there is any gleam of hope, it lies in Science. The men and women of Science, working selflessly in pursuit of taming the forces of nature and providing solutions to the most pressing challenges, is our best bet for a better world. It is not unimaginable that scientists will find ways to harness renewable energies cheaply and abundantly. It could well be that the efforts to build fusion energy reactors will bear fruit sooner than anticipated[6]. May be the breakthroughs in genetic engineering and genetic editing[7] will bring forth possibilities of growing wide varieties of new foods having superior nutritional properties and greater yields. The chemists and material scientists have already created materials with extreme strengths (graphene)[8] or having bespoke properties (metal organic frameworks)[9]. Mankind is poised to control nature in ways that was never before considered possible. What mankind has failed to control is its own nature of self-destructiveness.

COMSATS was established on the premise that only S&T can provide necessary means for sustainable development and that it is incumbent upon the leaders of the South to accord highest priority to this sector. The Goal 17 of the SDG declaration is stated in the words: 'Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development'. This is precisely what COMSATS has been striving to do. A Network of twenty Centres of Excellence, across three continents, affiliated with COMSATS is the platform that is being effectively utilized for this purpose. Our work is deemed laudable by all stakeholders, yet it is ironic that there is little funding available to carry on with some of the most transformational projects being pursued by COMSATS under its programme[10] of 'International Thematic Research Groups'. These multi-national groups, comprising of scientists of developing countries are engaged in solving some of the most important issues of our times, such as: 'Climate Change', 'Herbal Medicines', 'ICTs', 'Pollution Monitoring' and 'Agricultural Productivity'.

Through this Newsletter, COMSATS appeals to all the Governments of COMSATS' Member States to enhance financial support for the organization, and increase funding of the COMSATS' Centres of Excellence located in their respective countries. Any suggestions from readers to attract funding from international donors towards COMSATS' programmes, having direct relevance to SDG, would be highly appreciated. Any other comments and suggestions are also welcome. It is worth reminding that readers' views will also be considered for publishing in the Newsletter.

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[1] UN General Assembly Document, A/RES/70/1
[2] OXFAM International, www.oxfam.org
[3] FAO, World Food Programme, www.wfp.org
[4] www.usnews.com
[5] SIPRI, Milex database, www.sipri.org/research/armaments
[6] /phys.org/news
[7] /www.nature.com/news
[8] /www.nature.com/subjects/graphene
[9] /www.nature.com/subjects/metal-organic-frameworks
[10] /www.comsats.org

NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

COMSATS' Science Ambassador Emeritus delivers Talk on Science Diplomacy

COMSATS' creation was a result of the realization that the developing world needs to be conscious of the centrality of science and technology for development. Science advocacy is embedded in the very clauses of the organization's statutes, guiding its international programmes and activities since inception. Utilizing diplomatic channels among the member and other countries have been of key importance in successful execution of the organization's programmes. 'Science Diplomacy' as a programme, however, was institutionalized by COMSATS in February 2015, when it was launched during a roundtable meeting held in Islamabad. This Programme is aimed at creating awareness about the need of scientists-diplomats nexus in pursuit of peace and prosperity in the world. Among other components of the Programme, is a series of lectures by COMSATS' designated Science Ambassadors and other subject specialists in the realms of Science popularization, advocacy and diplomacy.

Dr. Qureshi delivering a Lecture on Science Diplomacy

Executive Director COMSATS, Dr. Imtinan Elahi Qureshi, who is also COMSATS' Science Ambassador Emeritus in the field of Science Diplomacy, delivered the second lecture of the series on February 29, 2016. Delivered to a select gathering of scholars and academicians, the lecture was held at the Faculty Development Academy of COMSATS Institute of Information Technology (CIIT), housed at COMSATS Secretariat Building in Islamabad.

The lecture entitled 'Science Diplomacy: An Overview' outlined how 'science' and 'diplomacy' come together in various forms serving related but different purposes, i.e., one supporting the other and vice versa, as well as the two complementing one another for interaction with the outside world. He accentuated that while science is value-neutral and objective, and offers no room for compromise on truth, diplomacy is aimed at negotiating compromises in the best interests of parties concerned. Dr. Qureshi highlighted how the coupling of the two terms leads to a whole that has helped individuals, groups and even nations overcome their social and political differences, leading to stronger and wider collaborations across the globe.

The lecture provided a historical context of Science Diplomacy, as well as its reincarnation in the modern world. In the historical context, Dr. Qureshi quoted examples from the Age of Reason, European Renaissance and Abbasid Caliphate. He highlighted how scientists in the past have been able to influence governments into taking actions on crucial issues of the time, e.g., Einstein's letter (1939) to the US President, which paved the way for the famous Manhattan Project. He also noted that scientists were the first to be concerned about the fall-out of nuclear technology and as early as 1955 the Einstein-Russell Manifesto was brought forward exhorting governments involved in the Cold War to resolve their differences peacefully. He noted that projects like the Apollo-Soyuz Test helped nations move away from an era of scientific contest towards an era of scientific cooperation.

Dilating upon the modern-day reincarnation of Science Diplomacy, he quoted the example of American Association for the Advancement of Science (AAAS), a scientific institution 160 years old, that has recently grown in influence in US public policy, which is evident from the establishment of a Centre for Science Diplomacy, in 2008. The Royal Society has exercised similar influence in the UK. Published in 2010, AAAS – The Royal Society: Joint Report "New Frontiers in Science Diplomacy" is another manifestation of collaboration for Science Diplomacy at the highest institutional levels.

Defining the scope and dimensions of Science Diplomacy, the related mechanisms in place in developed countries were also discussed. It was noted that Science Diplomacy is being used as soft power by developed countries through disbursement of aid, technology-transfer and sharing of scientific know-how. Dr. Qureshi quoted the successful international Science Diplomacy ventures, such as: European Organization for Nuclear Research (CERN), International Thermonuclear Experimental Reactor (ITER), and International Space Station (ISS). How the developing countries could benefit from Science Diplomacy was also discussed, especially in the context of Pakistan. It was noted that Science Diplomacy can help the developing countries on three major fronts: capacity-building; South-South cooperation; and control of natural resources. Dr. Qureshi also lauded the science diplomacy efforts of specific nature

Participants of the Science Diplomacy Lecture during Q&A Session

made by Cuba (Medicine), and Brazil (Agriculture), as well as other initiatives and institutional mechanisms applied in Africa (NM-AIST), Asia (ECO-SF), and the Middle East (ESCWA).

Apart from COMSATS' efforts that can be characterized as Science Diplomacy, since its creation in 1994, the organization's recent activities in this regard since the launching of the programme were recounted. These included: designation of Science Ambassadors; entering into collaboration with The World Academy of Sciences (TWAS) and, participation in AAAS-TWAS joint training programmes; initiation of public lectures; and necessary media projection of the Science Diplomacy programme. Dr. Qureshi also indicated COMSATS' other important interactions in this regard that include active liaison with the diplomatic missions in Pakistan and other Member States, and joint research programme, entitled COMSATS' International Thematic Research Groups.

Dr. Qureshi concluded his lecture with two proposals from COMSATS for the Government and other relevant institutions of Pakistan; one urging appointment of a Science and Technology Advisor to the Prime Minister of Pakistan, and the other institutionalization of 'Grand Challenges Pakistan' in order to identify and address major issues of the country, and work out their practical solutions through Science and Technology. It was noted that Canada, India, Israel, Thailand, Ethiopia, Brazil, Japan, China, as well as Africa are already benefitting from Grand Challenges Programmes undertaken by their governments or independent organizations. Such programmes should be emulated to have targeted solutions for specific issues of the countries, based on indigenous existing or improvised means.

Science Diplomacy Drivers*

- **Global Commons**
  - Outer Space
  - Atmosphere
  - Antarctica
  - High Seas
  - Cyber Space
- **Common Threats**
  - Global Warming
  - Food Security
  - Disease burden
  - Water Shortage
  - Energy Deficit
- **Interdependence**
  - Labour
  - Commodities
  - Know-how
- **Coexistence**
  - Disarmament
  - Treaties
  - Peace Agreements
- **Shared Prosperity**
  - Quality of life
  - Equitability
  - Rights and Liberties

** Qureshi, I.E., 2016. Science Diplomacy: An Overview [Slide No. 9].*

Feedback on COMSATS Newsletter

COMSATS' bi-monthly Newsletter successfully completed 7 years of publications in January 2016. Feedback on the past volume of the Newsletter (7th) has been sought from the recipients of the Newsletter, through various means including an online feedback form. The form seeks inputs on various variables including: currency of its contents, usefulness, structure, presentation, graphics, online accessibility, etc.

Online feedback have so far been received from relevant institutions from Bangladesh, Egypt, Jordan Malaysia, Pakistan, and Turkey. The inputs received show general satisfaction of the readers, as around 93 percent of the respondents are overall satisfied with the quality of the publication. 'Science Technology and Development' is the most popular section of the newsletter (64.3%) followed by Activities/News from COMSATS' Secretariat (60.7%), and S&T Indicators of Member States (46.4%).

Comments from NMC-NIgeria

I hereby convey the appreciation of Prof. A.R.T Solarin, the Director & CEO of NMC, for the kind coverage of the activities of the NMC in issues of COMSATS Newsletter and in particular the great coverage accorded the COMSATS' International Conference on Mathematical Modeling held in NMC, 28-29 December 2015, and the 2nd Meeting of the COMSATS' ITRG on Mathematical Modeling held on 30 December 2015 in the COMSATS Newsletter, issue 6 of Volume 7 (2015).

Mr. Olutunji Oladejo, Liaison Officer, NMC-Nigeria

Other comments

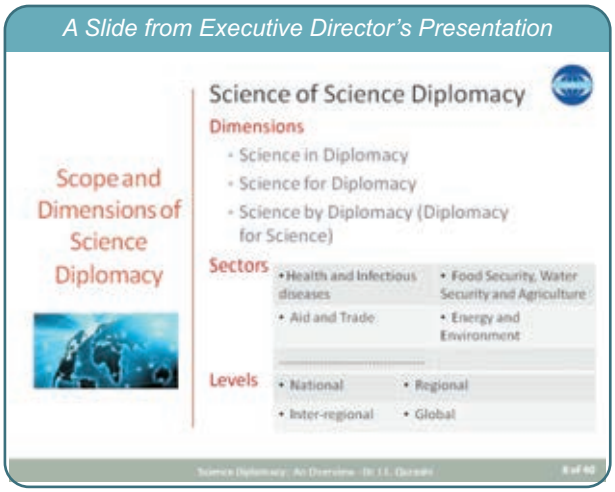
"COMSATS Newsletter in its present form is highly informative and contains high quality in news and articles about the development of science and technology in the South. Its get-up is also second to none. It can be compared to any newsletter published internationally."

Dr. Abdul Aziz, Advisor at CIIT, Pakistan

"The coverage is pretty nice, and tells us about what's happening around COMSATS."

Dr. Faisal F. Khan, Director CECOS, Pakistan

A Slide from Executive Director's Presentation



The lecture was followed by a questions and answers session that had participation from individuals belonging to various fields of specialization and backgrounds, including, biosciences, mathematics, physics, chemistry, management sciences, environment, and public policy. In addition to making queries regarding the contents of the lecture and making relevant recommendations, the participants appreciated COMSATS' aforementioned proposals and advocated necessary campaigning in this regard. They also took stock of the fields of science and technology in Pakistan that need to be aided through Science Diplomacy, such as food security and health. It was agreed that politicians and policy-makers need to be sensitized on such pressing matters by scientists and relevant organizations. Some specific observations and recommendations that transpired during the discussion are as follows:

- Science diplomacy should be fully utilized to motivate collaborations in matters of trans-border nature, such as climate change, pandemics, and regional conflicts;
- Developing nations should enhance their indigenous capacities and utilize local resources efficiently in order to reduce their dependence on developed countries; and
- A useful mix of social and natural scientists needs to be used in science diplomacy efforts for a wider outreach in the society.

At the conclusion of the event, Dr. Qureshi urged the participants to make concerted efforts to realize the objectives of Science Diplomacy, as well as to materialize recommendations. Hoping to regularize the lecture series to a lecture every month, he invited them to become active participants of COMSATS' Science Diplomacy Programme. In this regard, one of the participants, Dr. Habib Bukhari of CIIT, was invited to deliver a lecture on Bio-surveillance.

COMSATS' Publication 'AS-ICTP: 50 Years of Science for the Future - Views from Islamabad'

FEEDBACK BY KRISTOF VANDENBERGHE

(On behalf of the Director-General of UNESCO, Irina Bokova)
Focal point for Natural Sciences and the Intergovernmental Oceanographic Commission at Office of the Director-General of UNESCO

"The innovative format of the book, combining historical facts and figures, personal testimonies and photos makes it a very attractive publication to read and I will make sure to bring it to the attention of the Director-General. I am sure she will share my impression that the book demonstrates in every detail the importance and respect given to the scientific eminence of Dr. Salam. While reading the book, it occurred to me that in its more than 50 years of existence, the ICTP centre has always succeeded in maintaining its relevance. The emphasis may have shifted from the pure theoretical physics to a wider range of basic and applied (physical) sciences, but it remains a world-class research and education centre with an enormous convening power. It brings together young researcher from around the world to exchange knowledge and good practices, to freely interact with each other irrespective of nationality and religion. In the words of one of the authors, Dr. Butt, "it provides a platform that promotes international brotherhood and shaped the career of more than 116,000 scientists worldwide". The Director-General stated at several occasions that she strongly believes that the discussions in the frame of the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change have demonstrated that we will need more science and more scientific cooperation to tackle the problems that our planet and our societies face today. She is a strong advocate for a new vision for science, technology and innovation, for the benefit of all, especially for the most vulnerable and marginalized. I believe that this vision coincides entirely with the dream that Dr. Salam and Dr. Budinich had when they created the ICTP in 1964. UNESCO carries science at the heart of its mandate and with ICTP being its prime scientific research institute, we feel we have a solid basis to contribute our share in that important responsibility and I am reassured to see that we can rely on the commitment of organisations like your own. You will surely agree that the challenges that we face today are enormous, but with the help of COMSATS and likeminded partners by our side, I believe we can inspire whole generations of young people around the world and maybe convince them to dedicate a career to sciences for the benefit of all."

S&T INDICATORS OF MEMBER STATE

In Spectrum: Jamaica

Jamaica is the fourth-largest island country in the Caribbean. The island was discovered by Christopher Columbus in 1494 and had the initial settlements by the Spanish in early 16th century. The native Taino, who had inhabited Jamaica for centuries, were gradually exterminated and replaced by African slaves. England seized the island in 1655 and established a plantation economy based on sugar, cocoa, and coffee. The abolition of slavery in 1834 freed a quarter million slaves, many of whom became smallholding farmers. Jamaica gradually acquired its independence from Britain. In 1958, it joined other British Caribbean colonies in forming the Federation of the West Indies. Jamaica gained full independence when it withdrew from the Federation in 1962 (*CIA World Factbook*).

The island that has a tropical hot and humid climate is rich in bauxite, gypsum and limestone. The country has 41.1% of the area devoted to agriculture, with total 11.1% arable land, while 9.2% of the land is devoted to permanent crops and 21.1% is reserved as permanent pasture area. Forests occupy around 31.1% of the total land.

The country is facing climate change and environment related challenges in the form of hurricanes; heavy rate of deforestation; coastal water pollution by industrial waste, sewage, and oil spills; damage to coral reefs; and air pollution from vehicle emissions. Jamaica lies in the hurricane belt of the Atlantic Ocean and at times suffers from damages caused by significant storms.

According to the World Factbook, Jamaica is the 139th most populous country, with its population reaching over 2.9 million, according to July 2015 estimates. Jamaica is the third most populous Anglophone country in the Americas (after the United States and Canada), and the fourth most populous country in the Caribbean. The country boasts a large young population, with over 37% in the 25-54 years age bracket, as can be seen in the population pyramid of Jamaica (2015). The country has one of the lowest birth and population growth rates in the world with a higher urban population (54.8%).

Although HIV/AIDS is among the most significant health challenges in the country, Jamaica has been highly rated for improved clean drinking water and sanitation facilities. Jamaica has a high literacy, 88.7% in adults (15 years and over). Female literacy is higher than the national literacy rate. A desirable literacy has been achieved because of higher spending on education, as much as 6.5% of GDP (2013). UNESCO World Science Report (2015) indicates a need for improving higher education in the country, in addition to the basic education. At present, the Government of Jamaica is facing an important challenge of curbing high unemployment rates in young population.

The Jamaican economy is heavily dependent on services sector. The country continues to derive most of its foreign exchange from tourism, inward remittances, and export of bauxite/alumina. Remittances and tourism each account for 30% of the GDP, while bauxite/alumina exports contribute to roughly 5%. The bauxite/alumina sector was most affected by recent global economic downturns, while the tourism industry and remittance flow remained resilient.

The World Factbook estimates the Jamaican GDP at $24.6 billion (2015 estimates), with a GDP per capita income of $8,800. Agriculture contributes the least, around 7% of GDP, employing 17% of the population, followed by the industry

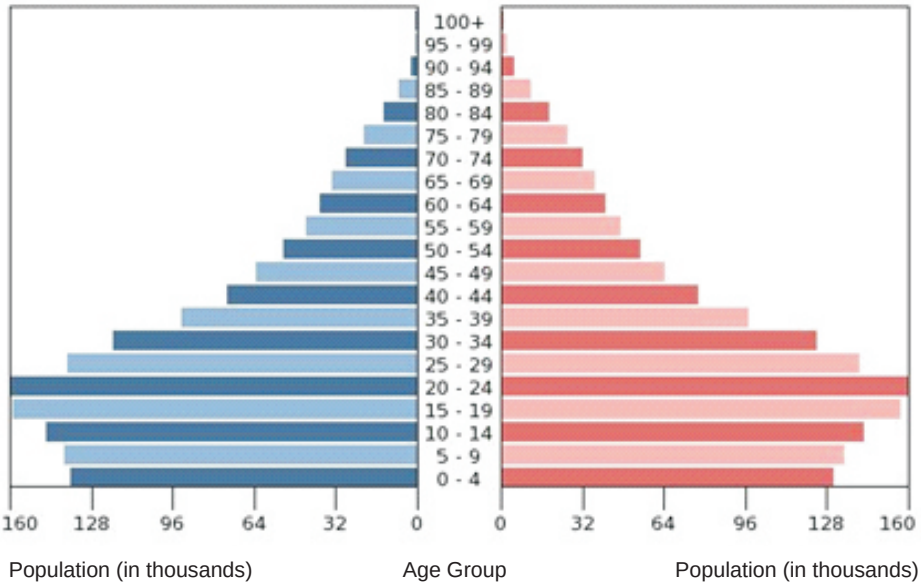
Selected Development Indicators for Jamaica

Indicator	1991	2000	2010	2013
Total Population (Million)	2.41	2.59	2.69	2.71
GDP per capita (current US$)	1,692	3,448	4,902	5,226
Merchandise trade (% of GDP)	71.92	51.85	49.68	54.89
High-technology exports (current million US$)	0.86	0.54	2.86	4.35
High-technology exports (% of manufactured exports)	0.13	0.06	0.57	0.67
Mobile cellular subscriptions (per 100 people)	0	14	116	102
Health expenditure per capita (current US$)		189.42	254.98	304.63
Gross enrolment ratio, secondary (%)	69.93	86.75	91.04	77.80
Gross enrolment ratio, tertiary (%)	6.58	15.38	28.93	28.74
Patent applications, nonresidents	39	90	142	97
Patent applications, residents	4	11	14	22

Source: *The World Bank's Development Indicators, February 2016*

(21.4%), employing 19% of the population, while services sector contributes the most (71.6%) to the GDP, employing over 60% of the labour force, a trend similar in other Caribbean island nations.

In the energy sector, Jamaica has done quite well, having an excess electricity production capacity. The country's nuclear and renewable energy sources still remain under-utilised. Most of the electricity produced comes from burning fossil fuels, a fact that needs attention of the Government in the wake of technology advancements in renewable energy sectors. One of the problems with electricity generation using petroleum sources in the Carribean is that the region's machinery is obsolete, inefficient and expensive to run. To deal with this Jamaica is constructing new gas-fired electricity generation plants.



Remarkable progress has been made by Jamaica in the telecom sector after a decision made in 1999 to liberalize and open the market for telecommunications services, resulting in rapid growth in mobile-cellular telephone usage, while the number of fixed lines in use has declined over the years. Combined mobile-cellular tele-density exceeded 110 per 100 persons in 2011, which is quite a healthy projection.

According to the 2015 UNDP Human Development Report, Jamaica's HDI value for 2014 is 0.719, which places the country in the high human development category, positioning it at 99 out of 188 countries and territories.

Jamaica's HDI Trends Based on Consistent Time Series Data and New Goalposts

Years	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP$)	HDI value
1980	71.5	11.1	5.3	10,989	0.648
1985	72.2	10.9	5.8	9,536	0.65
1990	72.1	11.3	6.5	11,257	0.671
1995	72	11.4	7.5	12,347	0.691
2000	72.3	10.9	8.6	11,790	0.7
2005	73.4	12.6	9.1	11,985	0.729
2010	74.9	12.9	9.7	8,419	0.727
2011	75.1	13	9.7	8,169	0.727
2012	75.3	12.7	9.7	7,836	0.723
2013	75.5	12.4	9.7	7,377	0.717
2014	75.7	12.4	9.7	7,415	0.719

Source: *UNDP Human Development Report 2015*

Between 1980 and 2014, Jamaica's HDI value increased from 0.648 to 0.719, an increase of 10.9 percent or an average annual increase of about 0.30 percent. Between 1980 and 2014, Jamaica's life expectancy at birth increased by 4.2 years, mean years of schooling increased by 4.4 years, and expected years of schooling increased by 1.3 years. Jamaica's GNI per capita decreased by about 32.5 percent between 1980 and 2014.

Jamaica's economy faces many challenges to growth, including high crime and corruption; large-scale unemployment and under-employment; and a debt-to-GDP ratio of about 130%. The attendant debt servicing cost consumes a large portion of the government's budget, limiting its ability to fund the critical infrastructure and social programmes required to drive economic growth. Jamaica's economic growth rate in the recent past has been stagnant, averaging at less than 1% per year for over 20 years.

Jamaica's first S&T Policy was promulgated in 1960. This policy was very ambitious, and eventually proved that the Scientific Research Council (SRC) of Jamaica would be unable to discharge the assigned array of duties, which included research and development, information collection and dissemination, coordination, popularization and research support. Its important function to promote

coordination never took place. Subsequently, the second S&T Policy of Jamaica was made in 1990 to ensure national S&T coordination and management by creating the National Commission on Science and Technology (NCST). The efforts of the Commission catered to the long overdue S&T advice, integration and management functions. However, it operated within the ambit of the old SRC law, without formal legal status and adequate financial and human resources.

Other important legislations related to Science and Technology activities in the country are:

- Agricultural Development Corporation Act (1952);
- Standards Act 57 (1968);
- Coffee Industry Regulations Act (1970);
- Cocoa Industry Control Act (1970);
- Petroleum Act (1979);
- Water Resources Act (1995);
- Educational Act (1995).

According to the World Science Report 2015, Jamaica has developed a sound roadmap in Science, Technology and Innovation (STI). The national consensus document 'Jamaica Vision 2030' places STI at the centre of national development efforts. The vision paves the way for Jamaica to become a developed country by 2030 through public sector reforms for operational consolidation of government and other publically funded R&D institutions, addressing the essential needs, achieving efficiency gains and accelerating innovation.

The Ministry of Science, Technology, Energy and Mining is responsible for the S&T landscape of the country. The key functions of the Ministry are categorized by the mandates that govern each sector. The Science and Technology Division of the Ministry is responsible for monitoring developments in the Information and Technology sector, whether the issues are related to job creation or Jamaica's advancements in technological innovation. The Energy Division oversees the functioning of the energy sector. It monitors energy supplies and identification of alternative energy sources, as well as means for energy conservation. The Mines and Geology Division of the Ministry has primary responsibility for the execution of activities related to mining. Under the Mining and the Quarries Control Acts, the Mines and Geology Division has statutory responsibility to exercise general supervision, over all prospecting, mining and quarrying operations throughout Jamaica.

Some Interesting Facts

- Jamaica was the first country in the Western world to construct a railway, even before the United States! This was only 18 years after Britain!
- Jamaica is the third largest island in the Caribbean.
- Jamaica is the first country to sign a Global Fund to Fight AIDS, Tuberculosis and Malaria grant agreement.
- Jamaica has the second largest butterfly in the world (The Giant Swallowtail).

One of the important S&T organization of Jamaica is the International Centre for Environmental and Nuclear Sciences (ICENS), Jamaica, which became a member of COMSATS' Network of International S&T Centres of Excellence in 1994. The Centre is located at Mona Campus of the University of the West Indies. It is a multi-disciplinary research centre which focuses on 'Peaceful Uses of the Atom'. At present, the main programmes of the Centre revolve around environmental geochemistry and health, with an overall objective of contributing to critical socio-economic issues, including environmental protection, and development and retention of local scientific talent of Jamaica. The research work undertaken at ICENS creates numerous opportunities for local and international cooperation.

Jamaica maintains cordial relations with a league of nations and has rallied international support and development cooperation from a number of multi-national organizations and development/donor agencies. Its potential as an emerging developing country with a remarkable base in education and rich human resources can be leveraged for attaining its national development goals. Jamaica has a huge potential to contribute to COMSATS' programmes at regional and international levels. Political and financial commitments on part of the Government of Jamaica may augment the country's presence in COMSATS and would help it benefit more from the organization's S&T led development activities.

Overview of STI Governance in Jamaica, 2015	
Body Responsible for STI policy	Ministry of Science, Technology, Energy and Mining
Additional Relevant bodies	National Commission for Science and Technology
Strategic Planning document (year of adoption)	Vision 2030 (2009)
Main objective of planning document	Developed country status by 2030
National award (year) and body responsible	National Innovation Awards (2005), Scientific Research Council
STI policy (year of adoption)	Yes, 1960
R&D priorities of STI policy	Effective exploitation of natural resources
STI action/ Implementation plan	STI Roadmap (2012)
Courtesy: *UNESCO World Science Report 2015-2030*	

ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

CIIT-Pakistan Professor wins Horizon 2020 Research Grant

Dr. Habib Bukhari, Professor, Department of Biosciences, COMSATS Institute of Information Technology (CIIT), Pakistan, won the Horizon 2020 research grant. The winning project proposal, is entitled 'MetaBLE, Advanced bioinformatics for genome and metagenome analyses with discovery of novel biocatalysts from extremophiles: implications for improving industrial bioprocesses'. This project aims to acquire new insights about the mechanisms of environmental adaptation, particularly for cold-adapted organisms, and to discover novel metabolic pathways and enzymes with potential industrial value. The project is developed with the help of many partners, with various specialties and capacities. UNICAM holds genomic sequences from psychrophilic and mesophilic ciliates that need to be annotated and analyzed. Cambridge provides the know-how for the discovery of new metabolic pathways valuable for understanding environmental adaptation. BMR Genomics and CIIT possess all the facilities for genome sequencing and annotation. EPI Inc. has expertise in comparative genome analysis. UNIMIB owns the facilities for the heterologous expression of gene sequences in bacteria and yeasts.

The discoveries made during the project may help the manufacturing of a new generation of ordinary facilities, as cleaning agents and biofuels, replacing chemicals in industry as a green technology application with a significant impact on the everyday life of European citizens.

CIIT Completes UNESCO Supported Project

CIIT has successfully completed UNESCO supported research project, titled "Survey, Identification and Combating Bio-Growth at Sirkap and Dharmarajika Sites in Taxila, Pakistan". The completion of this 12-month project was marked at a ceremony held on February 11, 2016, at CIIT, Islamabad. The ceremony was chaired by Ms. Vibke Jensen, Director UNESCO Pakistan. Mr. Abdul Nasir, Curator of Taxila Museum, Taxila, Pakistan; Mr. Humayun Mazhar, Secretary, Directorate of Archeology, Government of Punjab; Dr. Arshad S. Malik, Head, International Office, CIIT; and Dr. Izhar Hussain, Registrar, CIIT, also graced the occasion with their presence. The study aimed to find ways for combating bio-growth at Sirkap and Dharmarajika (archaeological sites at Taxila), and to find sustainable solutions to this common problem. During the course of this study, the research team identified and recorded the flora of the two sites, studied associated issues and was able to suggest suitable measures for mitigation, eradication and management of bio-growth.

Ceremony Marking CIIT's Completion of UNESCO Project

Ms. Jensen lauded the efforts of CIIT that she deemed helpful for preservation of archaeological sites in the country.

ICCBS-Pakistan and ASRT-Tajikistan sign MoU

The International Center for Chemical and Biological Sciences (ICCBS), Pakistan, and the Academy of Sciences of the Republic of Tajikistan (ASRT) signed a Memorandum of Understanding (MoU) to cooperate and develop activities, inter-alia, related to natural products, medicinal plant chemistry, pharmacology of herbal medicine, and drug-delivery system.

This MoU was signed under the auspices of Economic Cooperation Organization Science Foundation (ECO-SF) in a ceremony held at the Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD), ICCBS. Director ICCBS, Prof. Dr. Muhammad Iqbal Choudhary, and Director Institute of Chemistry - ASRT, Prof. Dr. Zayniddin Kamarovich Mudidinov, signed the MoU on behalf of their institutions. Dr. Manzoor Hussain Soomro, President ECOSF, Dr. Sonia Siddiqui of ICCBS, and other officials witnessed the signing ceremony.

Speaking on the occasion, Prof. Choudhary also announced ICCB's 10 fellowships for Ph.D. and post-doctoral scholars from Tajikistan, under the agreement. He stated that training can be imparted to Tajik technicians, students and faculty members to gain knowledge on sophisticated equipment available at ICCBS. Moreover, joint workshops will be conducted every year, alternately at ICCBS and ASRT. Prof. Mudidinov praised the scientific facilities available at ICCBS, and declared it one of the finest research establishments in the developing world. As per the MoU, it was agreed that exchange of research staff and facilities will also take place between the two institutions. Moreover, it was agreed that a joint research project will also be carried out in which exchange of research material, such as voucher samples and natural product extracts, will take place.

Director ICCBS-Karachi Inducted as Adjunct Distinguished Professor by University of Petra, Jordan

The Director ICCBS has been conferred upon a title of 'Adjunct Distinguished Professor' by the University of Petra (UoP), Jordan, in recognition of his meritorious scientific research and services in the field of chemistry. The decision was made by the University Deans' Council, and announced by the President of UoP in an induction ceremony in Amman, where a certificate in this regard was presented to Prof. Choudhary.

Prof. Choudhary has written and edited 27 books, most of which have been published in USA and Europe. He is also the author of over 900 research papers and chapters in top international science journals of the West. He has to his credit 32 US patents. The cumulative impact factor of his publications is 1,650. Prof. Choudhary also holds the title of 'COMSATS' Distinguished Professor'.

IRCC-Sudan holds Trainings for Sudanese Industrial Sector

As part of Sudan's ongoing national programme on industrial development, the Sudanese Ministry of Industry has planned to organize around 60 training programmes with the support of Industrial Research and Consultancy Centre (IRCC), Sudan. These programmes are expected to serve more than 10,000 beneficiaries from Sudanese industrial sectors. During the reporting period, two such trainings were held. These pertained to:

- Quality evaluation of milk and milk products (sensorial, physiochemical and microbiological tests), held from 7th to 18th February 2016 that benefitted 42 participants; and
- Safety Management of Industrial Chemistry, held from 7th to 11th February that benefitted 26 participants.

IRCC Training on Quality Evaluation of Milk and Milk Products

TÜBİTAK MAM-Turkey Offers Test & Analysis Services for Europe and Africa

TÜBİTAK Marmara Research Center (MAM), Turkey, has started to offer on-demand industrial test and analysis services for foreign clients. MAM, at its 7 internationally accredited Institutes and 612 laboratories, already conducts an annual average of more than 50,000 tests for meeting local demands.

MAM conducted tensile tests on package strappings at its Materials Institute's Mechanical Testing Laboratory, for a German company and has already reported the results.
Essential oil samples had been sent to the Chemical Technology Institute of TÜBİTAK MAM by Tanzania Industrial Research and Development Organization (TIRDO) after bilateral talks during Tanzanian delegation's visit to TÜBİTAK MAM in September 2015. These samples were subjected to various parameter analyses and the report has been sent to the Organization.

TÜBİTAK MAM carries out analyses on foreign-origin samples for customs transactions, in order to facilitate international test/analysis requirements and to generate revenue for itself from foreign clients. TÜBİTAK MAM also conducts R&D for providing tests and analyses that are otherwise not available in Turkey. The catalogue of the test and analysis services offered by TÜBİTAK MAM is available at: http://mam.tubitak.gov.tr/en/content/test-analysis-services

Foundation Stone Laid for Jordan's 'First Zero Net Energy Building' at RSS-Jordan

The Royal Scientific Society (RSS), Jordan; Aqaba Special Economic Zone Authority (ASEZA); and Aqaba Development Corporation (ADC), signed a memorandum of understanding on February 8, 2016, for scientific infrastructure development.

HRH Princess Sumaya, President RSS, Signing the MoU

Foundation Laying Ceremony of the First Zero Net Energy Building at RSS-Jordan

Second Module Embarapa Agrobiologia Course being Conducted (Photo by Ana Lucia Ferreira)

HRH Princess Sumaya bint El Hassan, President RSS, Dr. Hani Mulki, Chief Commissioner ASEZA, and Engr. Ghassan Ghanem, the CEO of ADC, signed the MoU on behalf of their organizations. ASEZA will be allocating a 30 donum plot of land as compensation to RSS that agreed to evacuate the premises of its Aqaba station to allow for the extension works of the 'Container and Travelers' Port' project, which ADC is executing. RSS intends to use the allocated land for developing its testing and technical service facilities in Aqaba.

During her welcome speech at the signing ceremony, HRH highlighted RSS' efforts in spearheading the development of the renewable energy sector for Jordan, which dates back to the early 1980s. HRH together with Dr Mulki laid the foundation stone for the new 1,300 square meter two-storey building, which has been designed to include a modern training hall, energy label testing labs for light bulbs, solar water heaters, solar collectors and complete solar system testing, as well as a wind tunnel for testing and calibration of wind sensors. The new building will also house energy labelling labs for washing machines, refrigerators and air conditioners.

This new green building will also be meeting its total energy needs, making it the first 'zero net energy' building in Jordan. This building was designed to conform with the new Green Building Guidelines, which were prepared by RSS for the National Building Council of the Ministry of Public Works and Housing.

Embrapa Agrobiologia - Brazil Course Covers Module on Seeds, Seedlings and Inoculants

The second module of a course on recovery of degraded areas (RAD) was held on February 2 and 4, 2016, at Embrapa Agrobiologia (Seropédica/RJ), Brazil. The module had the theme: seeds, seedlings and inoculants: theory and practice. The five-module course, with its last leg in April 2016, is aimed at facilitating necessary technology and knowledge in the society.

Under the second module, researchers and analysts deliberated on issues, such as the legalization of the activity of seed collection and seedling production; the organization of the forestry sector; seed collection in protected areas; the selection of parent trees for environmental restoration; and management of forest seeds. Inoculation practices for nitrogen-fixing bacteria and mycorrhizal fungi were also discussed.

Inauguration of the UNESCO Chair on Mathematics at NMC-Nigeria

The National Mathematical Centre (NMC), Nigeria, held a 2-day International Workshop on Mathematics (Algebra) Fundraising/Strategic Planning to hold between 12th and 13th January 2016. The event also marked the launching of UNESCO Chair Programme on Mathematics at the NMC. The workshop, inter alia, included discussions on the curriculum development (Algebra) networking and partnerships.

The inauguration of the UNESCO Chair on Mathematics took place during the second session of the Workshop. An overview of the UNESCO-NMC Chair Programme was given by Mrs M. Anene-Maidoh, Secretary General Nigerian National Commission for UNESCO (NATCOM). Good will messages were also shared by representatives from National Universities Commission (NUC), UNESCO and Vice Chancellors of several universities, present on the occasion.

A representative of the Honorable of Minister of Education inaugurated the UNESCO Chair Programme and after that unveiled the logo and banner of the Chair. Prof. A.R.T. Solarin, Director NMC, is the Chief Executive of the Chair.

OPINION: OFF-GRID ENERGY SOLUTIONS: OPPORTUNITY TO END EXTREME POVERTY

Abdur Rehman Cheema*

South Asia is the second largest home to the extreme poor people (400 million people on less than $1.25 a day) in the world after sub-Saharan Africa[1]. Pakistan has 50% of its population (92.5 million people out of 185 million) living below the international poverty line (2$/day) and 12.7% (23.5 million) in extreme poverty. Eradicating extreme poverty from the country by 2030 would not be possible without eradicating energy poverty.

The first target of the seventh Sustainable Development Goal (SDG) calls for providing universal access to energy and modern energy services by 2030. This universal energy access target had not been explicitly included in the Millennium Development Goals (MDGs). Why was this goal included in the SDGs? Energy access not only means having electricity but it leads to access to modern energy services in health, education, infrastructure and other areas. However, 1.1 billion people do not have access to electricity and 2.9 billion do not have access to modern energy services[2]. So what happens to the lives of those not having access to modern energy services? Just to mention one of the negative effects of not having access to modern energy services, around 4.3 million people die prematurely every year due to indoor pollution resulting from inhalation of toxic fumes from cooking and heating from inefficient fuels such as animal waste, according to the World Health Organization (WHO)[3]. Most of these people live in developing countries.

How these premature deaths perpetuate and exacerbate the vicious cycle of poverty? Poverty is multi-dimensional. Sickness is one of the main causes of poverty. As most of the extremely poor are employed in casual, daily wage labour, sickness for them can be costly. Not only can it result in loss of income but also hunger for the bread winners and their dependents. Thus, sickness can trigger a vicious cycle of poverty. Other than being a basic need, socio-economic development is directly linked to sustainable access to energy. Access to energy, and modern energy services need to be taken seriously, in order to be able to provide clean water, quality education, healthcare and sanitation services, as well as to boost the incomes of productive enterprises to end extreme poverty by 2030.

The question arises whether developing countries have resources to connect the off-grid places with the main grid. The answer clearly is no, and particularly for those communities living in remote locations where it is too costly to connect them with the main grid.

Of the developing countries, such as Mexico, where 97% of the population have access to electricity connected with national grid[4], solar energy solutions are used to light some of the houses out of the remaining 3% that are without electricity. Most of these are rural Mexicans living far away from town living in poor conditions and it is too expensive for the government to connect them with the national grid.

The Smart Villages Initiative

In view of this such situation, an initiative namely "Smart Villages Initiative" (SVI)[5] was started in 2014 by a team based at the Universities of Cambridge and Oxford in the United Kingdom with the support of the Cambridge Malaysian Education and Development Trust (CMEDT). The aim of the initiative is to focus on remote off-grid villages, where local solutions (home- or institution-based systems, and mini-grids) are both more realistic and cheaper than national grid extension. The title 'Smart Village', takes its inspiration from the much widely known 'smart cities' phrase. A smart city means a city equipped with basic infrastructure to give a decent quality of life, through clean and sustainable environment among other things. So a smart village means a village having access to affordable, reliable, sustainable and modern energy services among other things.

Starting in 2014, SVI serves six world regions, namely East and West Africa, South and Southeast Asia, and Central and South America, by bringing together a diverse set of stakeholders, including scientists and engineers, entrepreneurs, villagers and civil society organizations, policy-makers and regulators at country-level workshops. SVI addresses key issues such as to create the framework conditions necessary for entrepreneurs; leverage public and private sector investment; integrate energy access with other development initiatives; and work with a community level approach to meet the off-grid energy challenge. I attended one such workshop in October 2015 held in Islamabad. Following are some of the insights regarding opportunities and challenges to benefit from this initiative in the context of Pakistan.

Pakistan's Experience with SVI

The Islamabad workshop provided insights from the country's experience of off-grid energy provision to remote rural communities through the deployment of micro-grids among other renewables. In particular, the workshop brought together some of the actual beneficiaries of micro-hydro power projects implemented in remote areas with the financial and technical support of different Rural Support Programmes and the Rural Support Programmes Network (RSPN), the partner organization of SVI in Pakistan.

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Hydropower is the leading renewable source for electricity generation globally, supplying 76% of all renewable electricity. It has the potential to provide climate change adaptation services through its ability to store water, contributing to flood control and drought alleviation in some circumstances. In many of the remote locations in northern Pakistan, the micro-hydro projects are not only providing electricity for domestic consumption but also for productive enterprises, such as saw mills and farming. The Aga Khan Rural Support Programme and the Sarhad Rural Support Programme have both received the Ashden Award in recognition of their work in the micro hydro sector in northern Pakistan.

Surprisingly, these micro-hydro projects have been sustained for over a decade in most of the cases. Through a three-tier approach of social mobilization followed by the Rural Support Programmes, i.e. fostering Community Organization, Village Organization and Local Support Organization, communities are motivated to take charge of their development by contributing a portion of the cost of these micro-hydro project. In addition, communities provide their input in terms of land, labour, capital, skills and knowledge, referred to as 'sweat equity' (time and labour) contribution, that remains modest in most of the cases, and creates ownership and sustainability. Financial and technical support is provided by the executing agencies. Once the external support to the project is over, the project is maintained by the communities, and its benefits remain available to many future generations.

Local communities are part of the decision-making to set up domestic and commercial tariffs. The collected tariff is used for further strengthening of the local organisation and the power plant. Local committees are made to ensure recruitment of technicians and maintenance of the power plants. Involvement of communities and lower cost of maintenance helps to keep the tariff low and thus affordable to everyone.

One must appreciate the provincial government of Khyber Pakhtunkhwa for partnering and supporting the Rural Support Programmes in the establishment of micro-hydro projects in the province. The Board of Directors of Pakhtunkhwa Energy Development Organization approved the construction of 356 micro-hydel stations with a power-generation capacity of 35 megawatts in 2014[6]. These projects are spread all across the province including Abbottabad, Mansehra, Batagram, Tor Ghar, Kohistan, Malakand, Buner, Swat, Shangla, Dir (Upper/Lower) and Chitral. This energy access will particularly benefit women as they suffer from drudgery of fuel-wood collection; pay the price of traditional, biomass-based energy systems; and suffer the health consequences of cooking, smoke and small-particle pollution.

Opportunity for Pakistan

Taking the example of Pakistan, off-grid electrification is the only feasible solution to provide electricity to 3 million households residing in 8,000 villages, according to the Alternative Energy Development Board (AEDB) of Pakistan[7]. Since 2008, the people of Pakistan have been facing a huge energy crisis. In particular, the people living in rural areas connected to the national grid have been facing 12 hours a day of load shedding. Although urbanization is taking place, 60% of the country's population lives in rural areas. Out of the total, 30% (56 million people) of the population do not have access to electricity, most of them live in rural areas. Connecting all of these areas with the national grid would be too expensive for the government.

What needs to be done to further leverage from SVI?

A number of challenges require the attention of the government, private sector and the academia to further expand the SVI. As a regulator, the AEDB needs to establish a framework for facilitating and backing the off-grid energy solutions. The National Power Policy (2013) does not provide details of the initiatives to be taken by the government for providing energy to off-grid areas. Unlike neighbouring Bangladesh where the government has taken lead to introduce solar-home systems, most of the initiatives to connect off-grid areas have been undertaken by community-based organizations. Secondly, much needed research and development is required for innovating and manufacturing a low-cost long life battery for energy storage. In case of Balochistan, where solar energy is the source for providing energy to the remote rural communities, consistent energy supply can only be ensured with energy storage. However, unavailability of low-cost long life batteries remains one of the main hurdles for achieving this. As in many developed countries where tertiary educational institutions take up national challenges as their research agendas, the federal government must take lead to task engineering universities of the country to innovate such a battery. AEDB, Higher Education Commission (HEC) and, chemical and engineering research institutions must come forward and develop linkages with other relevant institutions in the world engaged in such projects. One such project is in progress at the University of Cambridge where lithium-oxygen batteries are designed to replace the typical lithium-ion batteries. The Higher Education Commission can also play a role by offering a research grant for developing a low-cost long life battery. The engineering universities of the country and the private sector can also jointly invest their skills and capital, respectively, to develop such a battery. Time to act is now.

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SCIENCE, TECHNOLOGY AND DEVELOPMENT

New Yeast Strain for Better Biofuel Production

Researchers at University of Wisconsin-Madison's Wisconsin Energy Institute, USA, engineered a new strain of yeast that could improve the efficiency of making fuel from cellulosic biomass, such as switchgrass. Both the yeast strain and the method of its design could help overcome a significant bottleneck in the biofuels production. The existing processes for making biofuel focus on ionic solvents that can deconstruct different kinds of biomass into relatively pure streams of a plant's sugar that are fermentable. But ionic solvents are toxic to the microorganisms that carry out fermentation to make biofuel. According to a report by Krista Eastman published in the University of Wisconsin–Madison website, on February 12, 2016, the University's researchers have engineered, using chemical genomics, a yeast strain that tolerates ionic liquids. By identifying a number of genes in industrially relevant yeast strains they were able to understand the precise nature of ionic solvents causing toxicity to yeast. They used this genetic information for successfully engineering a new strain of yeast by editing gene sequences, not only increasing its resistance to ionic solvents but also improving its ability to convert sugar and produce biofuel.

Artificial Kidney made with Silicon Microchip

Nephrologists at the Vanderbilt University Medical Center, USA, led by Dr. William H. Fissell, Associate Professor of medicine, are making major progress on a device to free kidney patients from dependence on dialysis or kidney transplant. They are working on building an implantable artificial kidney with microchip filters and living kidney cells that will be powered by a patient's own heart. The bio-hybrid device, reported in *Science Daily* on February 15, 2016, is the size of a human kidney and can remove waste products from the blood just like the real organ. These Silicon microchips used in the kidney are affordable, precise and make ideal filters. The device comprises of roughly fifteen microchips, layered on top of each other. Live kidney cells used in the devise will grow on the microchip filters that also work as silicon scaffolds. The silicon scaffold protects the embedded cells from the immune system thereby reducing immune rejection, which is the major reason for the failure of whole kidney transplants. Mathematical models and 3-D printing have been used to ensure smooth blood flow through the device so that it can be operated with patients' natural blood pressure.

LIGHTSABR Revolutionizes Drug-discovery

The Scripps Research Institute (TSRI), USA, is pioneering to work out low-cost and powerful methods to screen large 'libraries' of compounds, in order to find those with a desired biological activity for use as drugs. Scientists at its Florida campus have devised the central component of a screening system that is much smaller and cheaper than customary drug screening systems. The new approach has been developed by Principal Investigator, Brian M. Paegel, Associate Professor at TSRI. Published online in *Analytical Chemistry* and reported in *Science Daily* (February 10, 2016), this system starts with the use of "one-bead-one-compound" (OBOC) libraries, in which individual compounds are chemically attached to microscopic beads and lead to making OBOC libraries of millions of compounds in a week for about five hundred (500) US dollars. It is exponentially more economical compared to the high-throughput screening systems currently used that typically occupy 10,000 square feet of space or more and cost millions of dollars limiting their utility to large corporations and industries only.

The main device used in the system is built on the microfluidics principle that also underlies inkjet printer technology. Using a 'suspension hopper', the device introduces OBOC library beads into tiny liquid droplets that contain the assay of interest, such as an enzymatic activity assay. The volume of these assay droplets is about 100,000 times less than those used for high-throughput screening assays. The device then frees each compound from its bead with a photochemical reaction induced by ultraviolet (UV) light and after an appropriate period of incubation records the result in each droplet. Dubbed LIGHTSABR (Light-Induced and Graduated High-Throughput Screening after Bead Release) for its light-based cleavage of compounds from their carrier beads, the device offers high throughput at a low-cost making it possible to be placed in hundreds of laboratories around the world.

New Android App for Quick Seismic Monitoring

Sensor networks to monitor seismic activity are expensive. Many nations, especially those in developing countries, have only basic seismic networks. A newly developed app turns smartphones into sensors to collect data that can help provide earthquake related early warning to users. Developed by a team of seismologists, the app called 'MyShake', could be very useful for countries without a traditional seismic network. It has been made available for android phones. It enables the phone to record any shaking on the earth's surface at any given time of the day. At its initial stages, the app only collects information from the accelerometers and analyses it. The app relays the information and the phone's GPS coordinates to the Berkeley Seismological Laboratory for further analysis, if the processed information at the users' end fits the vibration profile of a quake. With increased number of users and rectification of other possible functional issues of the app, the data gathered from the app could be used for earthquake preparedness of people, miles from ground zero. (University of California – Berkeley website report by Robert Sanders, February 12, 2016).

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

DR. FATHOLLAH MOZTARZADEH, PRESIDENT, IROST, IRAN

Dr. Fathollah Moztarzadeh is the incumbent President Iranian Research Organization for Science & Technology (IROST) which is COMSATS' Centre of Excellence in Iran. He assumed the office in July 2015, succeeding Prof. Ahmed Akbari. Dr. Moztarzadeh also holds an office in the Government of Iran, i.e., Deputy Minister for Science, Research and Technology.

Born in Yazd in 1946, Dr. Moztarzadeh obtained his M.S. in Chemical Engineering from Technische Universitat Clausthal, Germany (1972), and subsequently completed his Ph.D. from the same institution in Materials Science (1976).

With his excellent credentials and research background, he has also been an academic; he is currently associated with the Amirkabir University of Technology Tehran, as a distinguished professor of biomedical engineering. He has also been contributing to academia at the highest level, inter alia, as:

- Member, Board of Directors, Iran University of Science & Technology, Iran (2014-2018)
- Member, Board of Directors, Organization for Researching and Composing University Textbooks in the Humanities (SAMT), Iran (2014-2018)
- Member, Board of Directors, Institution of Higher Education, non-profit Maziar (2010-2014 & 2014-2018)

As a researcher and science administrator, Dr. Moztarzadeh has served various advisory and leadership positions at Ministries, universities and research institutes in Iran and Germany. Some of which are as follows:

- Research Fellow, Crystal Growth Lab, Preussage AG, Federal Republic of Germany (FRG) (1976-1979);
- Head, Chemistry Division, Guilan University, Iran (1979-1980);
- President, Guilan University, Gilan, Iran (1980-1981);
- Deputy Director, Tarbiat Modares University, Iran (1981-1982);
- Head, Materials and Energy Research Center (MERC), Iran (1982-2006);
- Research Deputy, Ministry of Culture and Higher Education, Iran (1993-1997);
- Research Advisor, Ministry of Culture and Higher Education, Iran (1997-2006).

During his illustrious career in R&D, Dr. Moztarzadeh has contributed to various boards, councils, as well as working groups. Some of his notable memberships, in this regard, are as follows:

- Member, the National Research Council, Iran (1987-1998);
- Member, Technical and Engineering Committee of Central Board of Evaluation, Iran (1989-1994);
- Member, Board of Trustees of Research Organizations, Iran (1991-1996);
- Member, Council of University Degrees Evaluation, Iran (1992-1997);
- Referee of RAZI Medical Sciences Research Festival (2007, 2008);
- Member of Nanotechnology Research Center of Amirkabir University (2006-present).

Moreover, he was elected Fellow of the Academy of Sciences of Islamic Republic of Iran (1990-present), and is currently member of Basic Science Group of the Academy.

In recognition of his services towards scientific teaching and research, Dr. Moztarzadeh was conferred several prestigious awards. These include:

- Iran's Selected Academic Lecturer of the Year (1992);
- Iran's Selected Researcher of the Year (1992);
- ECO Award in the field of Natural Sciences (1993)

Dr. Moztarzadeh has published 189 papers in peer-reviewed international scientific journals. His recent work has appeared in reputed journals like: Ceramics International; IEEE Transactions on NanoBioscience; Materials Science and Engineering; Biotechnology and Bioprocess Engineering; Journal of Analytical and Applied Pyrolysis; Journal of Inorganic and Organometallic Polymers and Materials; Industrial & Engineering Chemistry Research; Journal of Biomedical Materials Research; and Journal of Non-Crystalline Solids. He has also published his scientific work extensively in the local languages of Iran. He has to his credit (1992 to 2005) authorship of six books on important subjects like precious metals, materials for biomedical applications, dental materials, ceramics and glasses.

Dr. Moztarzadeh has 25 patents that show his contribution to practical innovations in science and technology.

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COMSATS' BRIEF AND ANNOUNCEMENTS

Selected Forthcoming Scientific Events in COMSATS' Countries

30 - 31 May 2016	11th International Energy Conference, Tehran, Iran *(www.irannec.com)*
11 - 13 July 2016	2016 International Symposium on Energy Economics and Management, Beijing, China *(www.iaseem.org)*
20 - 29 July 2016	48th International Chemistry Olympiad (IChO), Karachi, Pakistan *(icho2016.pk)*
28 - 29 July 2016	2nd International Conference on Public Health, Colombo, Sri Lanka *(publichealthconference.co/2016/)*

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.

COMSATS NETWORK

BCSIR-Bangladesh
www.bcsir.gov.bd

ICENS-Jamaica
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