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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.



Signatories of the Turkey's Accession Agreement, ED COMSATS and Turkish Ambassador to Pakistan with the dignitaries attending the ceremony (Page-2)

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From the Executive Director's Desk

Scientific discoveries give rise to technological developments that change the way we lead our lives. More importantly, science enables us to understand the physical phenomena taking place in the material world and thereby enriches the collective knowledge of mankind about the cosmos around us. Thus, on the 4th of July this year when the European Organization for Nuclear Research, CERN, announced the discovery of a new fundamental particle that closely resembles the much anticipated Higgs boson, it was heralded as a discovery to be celebrated across the globe. COMSATS has an additional justification to rejoice over this development. The discovery of Higgs boson completes the last experimental proof of the electro-weak theory of Pakistani Nobel Laureate, Prof. Abdus Salam, at whose behest COMSATS was created in 1994. Higgs boson is also controversially called the 'god particle' because its force field is 'omnipresent', and it engenders the intrinsic property of 'mass' in other particles.

Prof. Peter Higgs of the University of Edinburgh is lucky to have his name associated with this particle, although at least five other scientists are as much responsible as Prof. Higgs to propose the underlying theory. However, no body grudges him this nomenclature, which he personally eschews owing to his own modesty and high regards for his fellow scientists. It is more dubious that the Indian scientist Satyendra Nath Bose, should somehow be linked with this discovery, as some

writers have tried to do in India. The name of Bose is there because the new particle is supposed to belong to a category of particles that follow Bose-Einstein statistics and are collectively called 'bosons'. The credit of this discovery is naturally due to a large number of scientists, engineers and technicians from all over the world working at CERN, who built and operated the accelerator called 'Large Hadron Collider' and its four major detectors.

In this saga of credit sharing, it is worth mentioning that Salam, Weinberg and Glashow are the ultimate heroes, whose theory leading to the Standard Model of Particle Physics is going to be gloriously vindicated if this discovery is confirmed by further experiments. COMSATS is proud to recall for the benefit of our readers that the Higgs mechanism came to lime-light only after Salam incorporated it in his theory that successfully unified the electromagnetic and weak nuclear forces. Previously, it was recognized as an ingenious mechanism only by a small coterie of theoretical physicists working in the then (1960s) arcane subject of Quantum Field Theories.

So, let us celebrate a great discovery and take this occasion to applaud the genius of Salam, who gave the world one of the most profound theories of Physics, apart from creating or helping to create a number of prestigious S&T organizations across the world.

NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

THE REPUBLIC OF TURKEY TO JOIN COMSATS AS A MEMBER STATE

On August 31, 2012, Mr. M. Babür Hızlan, Ambassador of Turkey to Pakistan, and Dr. I.E. Qureshi, Executive Director COMSATS, signed an agreement on behalf of the Republic of Turkey and COMSATS, respectively, to induct Turkey as the 22nd Member State of COMSATS. The agreement is to come into force after the issuance of a notification in this respect by the Government of Turkey. This Eurasian country has been associated with COMSATS since 1994 through its Centre of Excellence, TÜBİTAK Marmara Research Center (MAM).

H.E. Mir Changez Khan Jamali, Federal Minister for Science and Technology, Government of Pakistan, graced the occasion as the Chief Guest. Addressing the august gathering witnessing the signing ceremony, Mr. Jamali opined that Turkey's membership will greatly benefit the programmes and activities of COMSATS and set an encouraging precedent for more countries to join the Commission.

The Minister further noted, "Turkey's advancement in science, technology, innovation and industrial production will greatly benefit the South-South cooperation existing among the COMSATS' Member States and will greatly enrich the potential of the Member States to accelerate their pace of development".

In his Welcome Remarks, the Executive Director COMSATS stated that it is a matter of honour for COMSATS to have Turkey as a Member State. For Turkey, the excellent infrastructure and cooperation framework available through COMSATS is another door to reach out to a group of 21 developing countries across three continents.



The Federal Minister for Science and Technology addressing the gathering at the Signing Ceremony

Considering it a personal privilege to sign the accession agreement, Ambassador Hızlan expressed Turkey's eagerness to contribute to South-South cooperation in S&T through the platform of COMSATS and expected mutually beneficial outcomes for both the signatories. "Turkey is ready to contribute to COMSATS and believes in the strength of this cooperation", stated the Turkish Ambassador.

Speaking on the occasion, H.E. Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister on Social Sector, recalled her past and present association with COMSATS and considered it to be one of the most important forums through which Pakistan is extending help to other developing countries and in exchange benefitting from bilateral and multilateral cooperation. "Both Turkey and Pakistan", she believed "have an abiding interest in each other's progress and unwavering support for each other's policies."

Among other distinguished guests attending the ceremony were: Mr. Akhlaq Ahmad Tarar, Federal Secretary, Ministry of Science and Technology (MoST); Dr. Ishfaq Ahmad, Former Senior Advisor on Climate Change and Development at the Planning Commission of Pakistan; Dr. Javaid R. Laghari, Chairman Higher Education Commission of Pakistan and Coordinator General COMSTECH; and Dr. S. M. Junaid Zaidi, Rector COMSATS Institute of Information Technology (CIIT). In addition to the Ambassadors/High Commissioners of COMSATS' Member States and potential member states, the ceremony was attended by officials from MoST, Ministry of Foreign Affairs, COMSATS Secretariat, CIIT and COMSATS Internet Services.

By virtue of its State membership, Turkey will be represented at the Heads-of-State level Commission and the ministerial-level Consultative Committee of COMSATS in addition to Turkey's already existing participation in COMSATS' Coordinating Council. Turkey's membership is expected to



E.D COMSATS and the Ambassador of Turkey to Pakistan signing the Accession Agreement

bring in a new perspective and added value to the deliberations of these three statutory bodies of COMSATS, thus providing new impetus for development initiatives and strengthen COMSATS' regional and international programmes. Moreover, Turkey could serve as a window for effective North-South cooperation as it has representation in regional and international organizations, such as UN, OECD, ICSU, ICGEB, ECO, IEA, KEI, APSCO, and OIC; as well as various European research programmes, like COST, ESF, ESA, EuroHORCS, EUREKA, and EMBC.

USE OF SOLAR CELL MICRO-POWER SYSTEMS PROMOTED AT THE 5TH ASIAN SCHOOL ON RENEWABLE ENERGY HELD IN MALAYSIA

COMSATS co-organized the '5th Asian School on Renewable Energy: Advanced Micro-power Systems' from 9th to 13th July 2012, in Selangor, Malaysia. This international event was hosted by the Solar Energy Research Institute (SERI) of Universiti Kebangsaan Malaysia (UKM), and had the patronage of the Islamic Educational, Scientific and Cultural Organization (ISESCO); and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The School was organized with the objectives, inter alia, to:

- promote the use of environment-friendly technologies in the developing countries of Asia;
- create awareness among policy-makers, academicians and professionals of developing Asian countries on the concept of sustainable energy technologies viz solar, wind, biomass, fuel cell and hydrogen energy;
- introduce micro-financing schemes for mirco-power technologies; and
- orient the participants about the practical aspects of

micro-power system applications.

Speaking at the inaugural ceremony held on July 9, 2012 at UKM, Prof. Kamaruzzaman Sopian, Director SERI, UKM, welcomed the national and international participants and noted with appreciation ISESCO's initiative in launching this School for the Central Asian countries. The School was later given the theme 'Photovoltaic and Cottage Industry' in its 2nd event and invited participants from other Asian countries. During the 3rd School the theme was changed to 'Photovoltaics and Micro-power System', which has remained the focus of the School up till the 5th event of the series. Prof. Sopian thanked ISESCO, UNESCO and COMSATS for holding the event in Malaysia.

Expressing his views on the occasion, Mr. Abbas Sadri, Director ISESCO Tehran Regional Centre, noted that majority of the population of the developing countries has poor access to electricity and that the unfulfilled energy-needs worsen their living conditions and hampers development. Use of renewable energy can be an effective means to meeting the developing world's energy needs. Mr. Sadri informed that ISESCO is expanding its programmes of renewable energy and has formulated regional policies for promotion of energy efficiency, using clean and renewable energy in Islamic countries.

In his message read out on the occasion, the Executive Director COMSATS, Dr. Imtinan Elahi Qureshi, opined that the renewable energy technologies such as solar, photovoltaic, wind, and biomass, etc., have enormous potential to solve energy related problems of the developing countries, but a lot of efforts is required to realize this potential. He believed that it is imperative for all the developing countries to strengthen their regional and international linkages for research in the field of renewable energy.

Dr. Hamiza Ibrahim, Senior Vice President, Malaysian



Technical Session of the 5th Asian School in progress



Experts and participants of the 5th Asian School, Malaysia

Green Technology Corporation (MGTC) underscored the importance of energy supply for income generation through enhanced agricultural productivity and micro-enterprises in the developing world. Dr. Ibrahim noted that the availability of electricity to rural communities could be improved by employing renewable energy technologies that in turn will result in accelerating the developmental process and alleviating the widespread poverty in the society.

The event was spread over five days and was distributed in seven technical sessions. These technical sessions comprised 8 lectures and 15 presentations, as well as relevant practical trainings and case studies. The School helped promote practicable solutions using solar cell micro-power systems to meet the energy needs of the households and other loads in the rural communities, where grid-electricity supply is inadequate or absent.

The lectures were delivered on topics of key importance to the theme of the School by Dr. Sohif Bin Mat; Prof. Dato' Dr. Kamaruzzaman Sopian; Assoc. Prof. Dr. Nowshad Amin; Dr. Saleem Zaidi and Ir. Dr. Baharuddin Ali of SERI-UKM. The topics covered by these scientists in their informative and useful lectures related to Solar Energy Technologies, Pico Hydro Power System, Solar Photovoltaic Technology, Photovoltaic Thermal Collectors for production of heat and electricity, Biomass Resources and Technologies, Use of Software to Design Micro-power Systems (followed by practical case studies), Crystalline Silicon Photovoltaics, Fuel Cell and Renewable Hydrogen Production System.

Moreover, the presentations given by subject-experts from Bangladesh, Indonesia, Malaysia, Maldives, Pakistan, Sudan, Sri Lanka, and Turkey, included elucidations on the study of micro-generators, thermo-electricity, renewable energy development & feed in tariff, thermo-electric micro-power generation using biogas, and strategic study of sustainable energy system.

The presentations also included research related topics: Doping dependent textured TiO₂ thin films for Photo-catalytic and Solar Cell Applications; Applications of Power Electronics in the Distributed Renewable Energy System; Thermo-electric micro-power generation for mobile phone charging and LED lighting using biogas; R&D studies of Biogas production via different organic wastes; and Bio-degradation of lignocelluloses for biofuel production.

Thirty scientists, researchers, engineers, industrialists, technicians and academicians from various institutions of Bangladesh, Iran, Indonesia, Malaysia, Maldives, Pakistan, Sri Lanka and Sudan benefited from proceedings of the Workshop. The participants received practical training on Micro-power Systems and availed the opportunity to visit Green Technology Innovation Parks at UKM.

PROFILE OF THE CHAIRPERSON OF COMSATS

The incumbent President of the Republic of Ghana, H.E. John Dramani Mahama, is a writer, historian, journalist, and politician. He assumed the position of Chairperson of COMSATS on 24th July 2012 following the sad demise of the former President, Dr. John Atta Mills, who was elected as the Chairperson of COMSATS during its Second Commission Meeting held in April 2012, in Islamabad, Pakistan.



Mr. Mahama was born in Damongo, in the Damongo-Daboya constituency of Ghana. He received a bachelor's degree in History in 1981 and a postgraduate degree in communication studies in 1986 from the University of Ghana, Legon. He later proceeded to the Institute of Social Sciences in Moscow, Soviet Union for further studies.

During his early professional career, from 1991 to 1996, Mr. Mahama worked as the Information, Culture and Research Officer at the Embassy of Japan in Accra, Ghana, and served Country Office of PLAN International in Ghana as International Relations, Sponsorship Communications and Grants Manager.

In 1996, Mr. Mahama was first elected to the Parliament of Ghana. He was appointed as the Deputy Minister of Communications in April 1997, and was appointed as the Minister of Communications in November 1998.

Mr. Mahama was re-elected as a Member of Parliament for four-year term for the second and third time in 2000 and 2004, respectively. From 2001 to 2004, he served as the Minority Parliamentary Spokesman for Communications. In 2002, he was appointed as the Director of Communications for the National Democratic Congress (NDC). During the same year, he served as a member of the team of international observers selected to monitor Zimbabwe's Parliamentary Elections.

During his tenure as the Minister of Communications, Mr. Mahama also served as the Chairman of the National Communications Authority, and played a key role in stabilizing Ghana's telecommunications sector after it was deregulated in 1997. He has also been a member of the National Economic Management Team; a founding member of the Ghana AIDS Commission; a member of the Implementation Committee of the National Population Census (2000); and the Deputy Chairman of the Publicity Committee for the re-introduction of the Value Added Tax (VAT).

Continuing to expand his interest and involvement in international affairs, Mr. Mahama became a member of the Pan-African Parliament in 2003, serving as the Chairperson of the West African Caucus. In 2005, he was, additionally, appointed as the Minority Spokesman for Foreign Affairs. On 7 January 2009, he became the Vice-President of Ghana, who in line with Ghana's constitution replaced the President Mills on the latter's sudden demise.

President Mahama has a keen interest in environmental affairs, particularly in addressing the issue of 'plastic pollution' in Africa, to which he had devoted himself during his tenure as the Vice President. He has recently authored a memoir called 'My First Coup d'État and Other True Stories from the Lost Decades of Africa', published by Bloomsbury Publishing in July 2012.

RIO+20: HUMAN HEALTH, WELL-BEING AND SURVIVAL DEPEND ON THE FUTURE OF CITIES

by Anthony Capon, Professor of Public Health at University of Canberra, Australia

The secretary-general of the United Nations' (first) Earth Summit in Rio de Janeiro, Maurice Strong, famously declared that if our planet is to remain a hospitable and sustainable home for the human species, the battle would be won or lost in major urban areas. As world leaders confer at the second Earth summit (Rio+20), this message remains an essential one. The preparations for Rio+20 have identified sustainable cities as a priority issue for the summit.

Since 2008, cities have been the dominant habitat for the human species. For the first time in the history of human life on Earth, more people now live in cities than in the countryside. Many countries currently face urbanisation of unprecedented pace and scale: for example China, India, and others across Asia, South America and Africa.

By the middle of the 21st Century, the UN estimates we will need to house 2-3 billion more people in cities. That's more than 1 million people every week. Most of this population growth will be in medium-sized cities (populations between 500,000 and 1 million) in low and middle-income countries.

People are attracted to live in cities for varied reasons: work, education, social and cultural reasons, and access to healthcare. In fact, as the G20 economic summit in Mexico draws to a close, it is noteworthy that the current financial instability in Eurozone countries is causing some people to relocate from cities to rural areas in search of work, food security and housing. This highlights the potential for changing patterns of human settlement in future because of interdependencies between our global social, economic and environmental circumstances.

Cities can be great places to live; however living in cities can also pose risks to health. The World Health Organization and UN-HABITAT (the UN's urban settlements program) recently published a major report on health and cities. The report highlights the challenges and opportunities urbanisation brings and its effects on health and well-being. It reveals urban health inequities that result from different circumstances in which people grow, live, and work, and the health systems they can access.

While millions of people in low-income cities still don't have access to clean water, sanitation, adequate housing, or electricity – contributing to a continuing burden from diarrhoeal disease and respiratory infections – cities also confront epidemics of non-communicable diseases such as heart disease, diabetes, chronic lung disease, cancers and depression. In recent years, the UN has recognised these non-communicable diseases as barriers to sustainable development.

Beyond cities, ecosystems are the planet's life support systems – for people and all other forms of life. Ultimately, human health and survival are entirely dependent on the health of ecosystems because the human body has a fundamental need for food, water, clean air and relative climatic constancy.

Cities concentrate people and economic activity and, therefore, they also concentrate resource consumption and waste production. This means that the way cities work can affect the health of ecosystems. It follows that cities must be planned, designed, developed and managed to protect both the health of ecosystems, and the health of people.

If we build up (create denser cities) rather than out (urban sprawl), we can protect fertile agricultural land for future food growing. If we walk, cycle and use mass transit in cities, rather than the private car, we will consume less fossil fuel energy in every trip. At the same time, we will reduce motor vehicle emissions and we will get more physical activity, which is good for health and well-being.

While urbanisation presents challenges, it also provides considerable opportunities. The International Council for Science (ICSU) has recently launched a new global interdisciplinary science program on health and well-being in the changing urban environment using systems approaches. The program aims to bring scientists together with counterparts in government, industry and communities to tackle critical urban policy and planning questions. The approach will identify leverage points for intervention, while recognising causes of policy resistance and potential unintended consequences of such interventions. The new program will strive for "co-creation" of knowledge to improve decision-making; an approach that acknowledges the expertise of those who make decisions on a daily basis, seeking new insights through effective applied research.

Human health and well-being, on a sustainable basis, should be the primary objective of urban policy and planning. To achieve this objective, an important starting point is an understanding of the universal health needs of the human species which have been clearly identified by Stephen Boyden, an eminent human ecologist. There are compelling reasons for urgent action; both for the sake of the health of future generations and for the sake of our own health right now. By the time of the next Earth Summit, the current window of opportunity to do things differently in cities will have closed. We will have already housed many of those extra billions of urban residents and it will become a question of retrofitting cities for sustainable ways of living. This would be even more difficult and expensive.

Beyond Rio+20, we must ensure that our cities are healthy and sustainable human habitat. There is a role for us all in this effort: for urban planners, public health workers, engineers, land developers, elected officials and anyone who has a stake in the future of our cities.

About the Article: *This article is an edited version of an address to the ICSU forum on science, technology and innovation for sustainable development in Rio de Janeiro, Brazil, 11-15 June 2012. Source: <http://theconversation.edu.au>
Also see the current work on this topic by ICSU Regional Office for Asia and the Pacific (ROAP) at URL: www.icsu.org/icsu-asia/news-centre/news/icsu-roap-urban-health-and-wellbeing-research-scoping-workshop*

ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

RSS-JORDAN SIGNS MOU WITH UN-HABITAT

In order to enhance the effectiveness of their development efforts, the Royal Scientific Society (RSS), Jordan, and UN-HABITAT signed a Memorandum of Understanding for collaboration. RSS aims to build and strengthen scientific research in key areas of strategic value to Jordan's long-term competitiveness and development. UN-Habitat's global endeavour is to promote 'Sustainable Urban Development' and 'Shelter for All'.

On a non-exclusive basis, RSS and UN-Habitat will collaborate in areas of common interest in relation to Citizen Participation; Urban Development and Governance; Construction and Materials; Affordable Housing; Energy, Water and Environment; and Disaster Risk Reduction, Prevention and Preparedness. By joining hands for R&D; knowledge exchange; capacity building; and advisory & technical assistance, the two organizations aim at promoting Jordan as an incubator of knowledge creation and transfer within Jordan and, subsequently, across the Arab region.

Prof. Odeh Al-Jayyousi, Vice President for Science and Research of RSS, considers this MoU as a starting point for genuine collaboration with UN-Habitat to provide smart solutions for new generations having a special focus on environment protection, resource efficiency, and citizen participation in sustainable urban development.

DR. JAMIL HADDAD OF RSS WINS 'BEST INVENTION FOR 2011' AWARD

In a ceremony organized by Philadelphia University of Jordan, Dr. Jamil Sami Haddad, a Researcher at RSS, was given the 'Best Invention for 2011' award for his 'vibrating dryer'. In addition to a large number of scholars, intellectuals, deans and faculty member, Ms. Laila Sharaf, Chairperson Board of Trustees, Philadelphia University, and the University President, Dr. Marwan Kamal, were present on the occasion.



Dr. Haddad receiving the 'Best Invention for 2011' award

The invention is about an efficient compact-sized dryer for drying powder and granular products using vibration and pumping hot air through the vibrating layer. This technique is useful for products used in mining, chemical or pharmaceutical industries, food industry, or similar applications, and uses less power than other drying techniques.

The device uses a vibrator with controlled amplitude frequency direction. The vibrating dryer also has sets of overlapped parallel rotatable shelves, it is compact in size, and its size can be reduced to half the size of the dryers available in market. The device requires half the amount of hot air compared to other dryers. Moreover, the device uses cyclone to evacuate the hot air and particles of dried material.

BCSIR-BANGLADESH ESTABLISHES NEW INSTITUTE AND LABORATORIES

The Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh, has proudly established its latest unit 'Designated Reference Institute for Chemical Measurements' in Dhaka. The Institute was inaugurated by Prime Minister of Bangladesh, H.E. Sheikh Hasina, on June 10, 2012. This newly established institute is equipped with state-of-the-art equipment and is one of its kind in Bangladesh.

In addition to the afore-mentioned institute, two more laboratories, (i) Bio-metallic Implant Laboratory, and (ii) Food Safety Laboratory, have been set up under Bangladesh's Annual Development Programme (ADP) that also provide state-of-the-art research facilities.

ACHIEVEMENTS OF THE SCHOLARS OF CIIT-PAKISTAN

Dr. Asghar Khan and Dr. Saqib Hussain of the Department of Mathematics, COMSATS Institute of Information Technology (CIIT), Abbottabad Campus, received 'Research Productivity' awards of the Pakistan Council for Science and Technology (PCST) for the year 2011. Also, Dr. Sultan Hussain was awarded post fellowship by the Institute for Financial and Actuarial Mathematics, University of Liverpool, UK.

Ms. Faiza Sajjad, a lecturer at Department of Management Sciences, CIIT Abbottabad Campus, has published a book titled "TQM Practices and Organizational Development". Dr. Shehla Amjad is the co-author of this book.

CIIT-PAKISTAN ESTABLISHES INFORMATION TECHNOLOGY PARK AT ITS ABBOTTABAD CAMPUS

Inauguration of Information Technology (IT) Park at CIIT Abbottabad Campus was held on July 18, 2012. The IT Park

is aimed to promoting IT culture and creating better job opportunities for the young generation of Hazara Division, in particular, and the whole Khyber Pakhtunkhwa (KPK) province of Pakistan, in general.

H.E. Mian Iftikhar Hussain, Information Minister of KPK graced the event as Chief Guest. Other members of the provincial assembly of KPK present on the occasion were: Minister for Science and Information Technology, Mr. Ayub Ashari; Minister for Industries and Commerce, Syed Ahmed Hussain Shah; Minister for Auqaf, Hajj, Religious and Minority Affairs, Namroz Khan; Secretary Science and Information Technology, Mr. Humayan Khan; and Director Projects KPK IT Board, Mr. Arbab Usman. Officials of IT board and software developing companies also attended the ceremony.



Launching Ceremony of IT Park at CIIT Abbottabad Campus

EMBRAPA AGROBIOLOGIA - BRAZIL HOLDS A TRAINING COURSE ON COMPOSTING

On August 21, 2012, Embrapa Agrobiologia, Brazil, held a training course on composting, in partnership with the Enterprise Technical Assistance and Rural Extension (Emater). The training featured a lecture on fertilizers, 100% vegetable organic substrates and the composting process. The lecture was delivered by Dr. Marco Antonio Leal and Dr. Silvio Santos, both researchers at Embrapa Agrobiologia.

The composting procedure aims to accelerate and steer the process of natural decomposition of organic materials. The composting techniques aim to produce optimal conditions in order to increase the efficiency of the compost and humus to obtain organic fertilizers, rich in nutrients and free from biological and chemical contamination.

According to the researcher Dr. Marco, composting entirely of vegetable origin has several advantages. It uses renewable raw materials that are abundantly available, requires no addition of inoculants or other additives, and has



Demonstration of composting techniques at Embrapa Agrobiologia

little risk of biological contamination. He further pointed out that composting of vegetable origin demands less surveillance and hence less manpower, and produces fertilizers and substrates superior to products commonly found in the market.

In addition to theoretical explanations of important concepts, practical demonstration was given for preparing a compost pile. Fifty three farmers, environmentalists, and students of Nova Iguaçu and the Brazilian lowlands attended the course.

EMBRAPA AGROBIOLOGIA COMMERCIALIZES ITS TECHNOLOGY ON AGROECOLOGICAL PRODUCTION OF XAXIM

On August 22, 2012, Embrapa Agrobiologia held a training course on its technology of the ecological production of xaxim. Xaxim is a type of pteridophyte with an aerial stem generally perpendicular to the soil and from which hundreds of roots arise to absorb water from the environment. The xaxim stem is used to make flower pots and other plant supports for gardening (also popularly known as xaxim). The agro-ecological farming practices are built upon local skills and are adapted to local agroecological and socio-economic conditions.

The course was conducted for the Brazilian company, Coco Verde RJ (V3 Foods). Through a notice published in March 2012, Coco Verde RJ (V3 Foods) has been licensed to produce and market for the next five years the said technology developed at Embrapa Agrobiologia. Dr. Marco Antonio Leal, a researcher at Embrapa Agrobiologia, who developed the afore-mentioned technology for the company, conducted the course for its relevant personnel. The training comprised step-by-step demonstrations on use of the technology.

The managing partner of Coco Verde, Edemilso Gonçalves,



Registration and course is free for the unemployed while employed graduates have been encouraged to participate by applying through their employers.

The Programme design is as follows:

- a. A month of intensive lectures and examinations in core under-graduate courses;
- b. Successful candidates will proceed to two months foundation post-graduate courses, while the rest will undertake one-month training on teaching mathematics, consultation and entrepreneurship, and one-month industrial work experience.

The programme that will be conducted at NMC has been designed to prepare the participants for post-graduate studies in the relevant fields and equip them with entrepreneurial skills leading to gainful employment.

RESEARCHERS AT NRC-EGYPT ESTABLISH HARMFUL EFFECTS OF DIOXINS

Studies at the National Research Centre (NRC), Egypt, on the environmental pollutions caused as a result of burning garbage and plastic trash containing polyvinyl chloride, have established the harms of dioxin compounds on the human health. These harmful chemicals are also produced in paper industries. Meats, dairy products, eggs and fish are the major food products containing fats with dioxins to affect humans. Dr. Mounira Abdel Lateef, a researcher at the Biochemistry Department of NRC, showed that these dioxins have the ability to diffuse through air from the point of origin to affect the agricultural soil, plants and animals at distances, where they settle in fat tissues and become difficult to remove. Intake of the meat from animals containing these dioxins in their bodies exposes the humans to their higher concentrations. Exposure to these compounds for an extended period and/or higher concentrations increases the risk of liver, lung and stomach cancers, and also affects the immune system causing hypersensitivity to bacterial and viral infections. Another implication of the dioxin compounds is sterility and miscarriages as they also affect the reproductive health of humans.

In order to ensure the reduced risks from exposure to these dioxins, Dr. Safaa El-Serougy, a researcher at Environmental Medicine Department, NRC, suggested health precautions that include: avoiding intake of meat fat, using low-fat dairy products and eating sufficient amounts of fruits, vegetables and cereals. Avoiding burning trash in the open air and using special incineration with 850-1000°C instead could keep the amounts of the dioxins under control. The chlorine from the bleaching paper and petrochemical industries should also be properly disposed of to keep it from contaminating water used for irrigation.

stated that the technology and its product meet the company's expectation that intends to start its production soon.

NMC-NIGERIA HOLDS SENSITIZATION TALK ON 'COMSATS AND ITS ACTIVITIES'

A seminar on 'COMSATS and its Activities' was held at the National Mathematical Centre (NMC), Nigeria, on July 25, 2012. In the absence Prof. A. R. T. Solarin, Acting Director and Chief Executive NMC, Prof. Adetula presided over the seminar. Thirty six participants, mostly academic staff of NMC, attended the talk; notable amongst these were: Prof. B. O. Oyelami, Dean of School of Theoretical Physics; Dr. Bala Dauda Alhaji Muhammed Jazuli, the General Manager, NMC Consult; Mrs. Christianah Oitu Aje, the Centre's librarian; Mr. Obayomi Olukayode, and the Principal Personal Secretary to the Chief Executive NMC.

Mr. Olutunji Oladejo, NMC-COMSATS Liaison Officer, gave a detailed multimedia presentation on the 'COMSATS and its Activities'. The presentation covered: Introduction to COMSATS; Activities of COMSATS; COMSATS' International Thematic Research Groups; and Benefits and Obligations of COMSATS' Membership. The attending scientists and researchers were encouraged to make scholarly contributions to COMSATS' journal, Science Vision.

NMC ANNOUNCES MATHEMATICAL SCIENCES GRADUATE FOUNDATION DEVELOPMENT AND ENTREPRENEURSHIP PROGRAMME

NMC-Nigeria announces its Mathematical Sciences Graduate Foundation Development and Entrepreneurship Programme, to be held from January to March 2013. The programme has been designed for all unemployed Mathematical Sciences Graduates (Mathematics, Statistics, Computer Science, Physics and Mathematics Education).

SCIENCE POLICY AND INNOVATION IN JORDAN: THE WAY FORWARD

Odeh R. Al-Jayyousi

The relationships between science, technology and innovation (STI) policies are neither simple nor linear. However, the accumulated experience from applying STI policies in the U.S, EU, and Japan can provide policy guidance for Jordan.

Historically, science policy was viewed as a driver for economic development, growth and prosperity. The task for science policy was defined in terms of national security, health, environmental sustainability and economic growth as a part of new social contract for science. Technology policy played a key role in England in the 16th century in the development of cannons made out of iron. This programme was successful because England had access to iron ore and fuel wood. This programme was realized through establishing a consortium of experts and workers coming from France and other countries. In the 19th century, the Danish economy was based on corn but due to economic constraints it was shifted to butter. This shift was not possible without standardization, and the technical and social innovation in dairy processing. This also entailed the education of farmers and the formation of cooperative ownerships around dairy plants.

A key lesson to be learnt is that state-led science, technology and innovation policy is necessary but not sufficient for inducing macro-shifts in economy and society. It requires a broader social mobilization to overcome barriers impeding socio-economic development.

The U.S experience in innovation policy was remarkable in upgrading agricultural activities through establishing specialized universities for agriculture and extension services. This helped in diffusion of ideas among farmers. The recent development in biotechnology and pharmaceuticals has bridged the gap between research and industry and, therefore, the organization of R&D institutions and universities have become a critical item on the agenda for reform in STI policies. STI policies can be characterized as pro-market or pro-state but experiences worldwide vary in

scope, relevance, and context. For example, the U.S technology policy in space technology was a priority during the Cold War, which motivated a set of innovations in telecommunications.

On the other hand, the EU policy promoted national champions in specific sectors to address the dominance of U.S multi-national firms in high technology sectors. While Japan's technology policy was driven by a national strategy of catching up and adapting to the Western models of technology development.

In the national context, Jordan's National agenda articulated the role of STI in transforming Jordan to a knowledge economy in a well thought-out plan that considers Jordan's human, social, financial, and natural capitals. The enabling environment and infrastructure in STI as manifested in El Hassan Science City, which hosts the Royal Scientific Society, Princess Sumaya University and El Hassan Business Park, presents a unique ecosystem that links education, R&D and innovation. There is a window of opportunity to harness the potential of STI in Jordan in the new era of green economy, clean technology and renewable energy. The path of innovation is clear for Jordan, and the human and intellectual capital is available to move forward with optimism and hope.

The Arab Spring should bring a new era of optimism for STI in Jordan. It is only when basic research is allowed to move along its own trajectories that new avenues for applied research and innovation will emerge. Critical science is an important element in democracy because it enhances sound reasoning, evidence-based solutions and results that support people-centred development.

Finally, to nurture and sustain innovation in Jordan and the Arab region, we need to make sure that all institutions are able to coordinate their work to address various systemic needs, ranging from poverty and unemployment to brain drain in science and technology.

About the Author: Prof. Dr. Odeh R. Al-Jayyousi is the Vice President (Science and Research) of Jordan's Royal Scientific Society. Prior to taking his current post, Professor Al-Jayyousi was the Regional Director at the West Asia/ Middle East Regional Office, of the International Union for Conservation of Nature (IUCN). He was awarded his Masters and then, in 1993, his Ph.D from the University of Illinois at Chicago, in Urban Planning and Public Policy Analysis. He taught for 10 years at the Applied Science University, Jordan, where he became Professor of Water Resources and Environment and Dean of Research. Professor Al-Jayyousi has worked in the US, at the City of Chicago's Department of Planning, and at the University of Illinois' Center for Urban Economic Development. As a consultant, he has advised EU and UN agencies, the World Bank, and GTZ. He has published several scientific articles in various international journals. Email: odeh.jayyousi@rss.jo



SCIENCE, TECHNOLOGY AND DEVELOPMENT

NEW EFFECTIVE TECHNIQUES FOR DETECTION OF SUB-STANDARD DRUGS

In many developing countries, sub-standard drugs are sold due to weak regulatory and enforcement systems and, in many cases, even the legitimate drugs become sub-standard due to manufacturing failure, poor storage facilities, exposure to sunlight or degradation. Many people die in the poor societies by taking such degraded drugs. Often the procedures to test drugs for their validity in the developing countries require long time due to scarcity of qualified and experienced staff, accurately functioning equipment and bureaucratic hurdles.

Researchers have announced (*SciDev.Net*, August 9, 2012) that a microchip tailored to detect a specific active ingredient in a drug costing a few US cents could help in efforts to detect counterfeit and substandard medicines in the developing world. The replaceable microchips come in a portable shoe-box sized device which is equipped with a fluorescent probe that binds to an active ingredient in a drug sample and the strength of its glow indicates the quality and quantity of the ingredient in the drug. The device is expected to complete field tests in about two years and will cost 20 per cent less than the existing technologies. It has been ensured that the new technology is suitable for implementation in the developing world viz. cost, access, mobility and available infrastructure.

SIMPLE CONSTRUCTION SYSTEMS FOR DISASTER-STRICKEN SOCIETIES AND THE DEVELOPING WORLD

Poor societies in the developing world remain without housing or shelter after disastrous natural events like earthquakes and floods. Extreme weather conditions due to climate change are inflicting miseries on the poor populations with more frequency than before. This misery is augmented manifold when the densely populated areas are hit by earthquakes.

New but simple technologies are emerging that provide hope for homeless people in the disaster-stricken areas as well as those who wish to build homes with low construction costs. Two of these technologies have been reported in the recent issues of *SciDev.Net*. In its August 7, 2012 publication, the Network describes how jute when mixed with resin can be transformed into a sustainable and affordable building substance. This could provide building blocks for cheap housing to millions of homeless people around the world and could also be used to build shelters in disaster-stricken areas. The other innovation published by *SciDev.Net* relates to a new technique for building low-cost houses in earthquake prone areas and could be rolled out in any developing country with a seismic risk. The system consists of pre-fabricated steel bars in the form of trusses, triangular support structures which are welded together to form grids that, in turn, form the walls and ceiling of a house,

essentially forming a lightweight steel structural skeleton. These skeletons are then filled with hollow bricks of abode – a building material made from clay, sand, water and natural fibres. According to the laboratory tests, the houses reinforced with trusses could endure severe earthquakes. All material could be made or acquired locally.

NEW POSSIBILITIES FOR SOLAR POWER GENERATION

A significant breakthrough has been achieved in solar technology and reported in *e!Science News* (July 10, 2012). The research has led to a new solar photovoltaic thermal (PVT) system that generates both electricity and heat. Solar PVTs are normally made with crystal silicon cells, which generate electricity but little heat. In the cold regions of the world, heat energy is also in great demand in addition to electricity. A new design of the PVT system has been described which uses amorphous silicon cells. The research shows increased heat generation because of higher operating temperatures and 10 per cent more solar electricity output. This research opens up an entirely new application of amorphous silicon. Amorphous silicon has several advantages over crystal silicon. It requires less material, costs less to manufacture and offers higher return on investment, which makes it more economical. The research also shows amorphous silicon solar cells can be made into thicker cells as long as they are operated at higher temperatures in the PVT system. This breakthrough has a promising commercial opening in the entire world and the applications will help reduce the carbon dioxide content in the atmosphere.

ALTERNATIVE FUEL PRODUCTION WITH HIGHER YIELDS AND LOW COSTS

World energy demand and higher costs of fossil fuels have greatly increased the efforts to find alternative energy sources with more fuel efficiency, lower costs and having environment-friendly characteristics.

Ethanol and butanol are two viable options in this regard. However, butanol seems to have an edge over ethanol in having around 30 per cent more energy content than ethanol, lower vapour pressure, less volatility, less flammability and higher mixing property with gasoline. So far the large scale production of butanol has been hampered by the nature of procedures involved. But a new technique recently developed (*e!Science News*, August 14, 2012) has increased the yield of butanol by 100 per cent and the energy use is reduced by 3 to 4 folds. This technique uses a new co-polymer for fermentation and a better method of phase separation of butanol from the product solution to avoid the conventional distillation techniques that require higher energy cost. This breakthrough would greatly increase the chance of butanol as becoming an alternative fuel option giving a boost to the economies of the developing countries.

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

PROF. DR. AHMAD ISMAIL MUSTAFA, CHAIRMAN BCSIR – BANGLADESH

Prof. Dr. Ahmad Ismail Mustafa is an eminent professor and scientist who has devoted himself to the sustainable development of Bangladesh. Prof. Mustafa has been deputed by the Government of Bangladesh as the Chairman of the Bangladesh Council of Scientific and Industrial Research (BCSIR), which is the leading multidisciplinary research and development (R&D) organization of the country. Prof. Mustafa is highly regarded as an academician owing to his outstanding contributions in teaching, research and administrative activities for the country. His intellect and diligence for development in the science and technology and education sectors of Bangladesh is praiseworthy.



Prof. Mustafa joined the Department of Applied Chemistry and Chemical Engineering of the University of Dhaka as a lecturer, and later became the youngest faculty member of the University to be promoted as Professor. Well reputed in the academic circles, he has served the University of Dhaka for about 39 years. Prof. Mustafa introduced the in-plant training programme for the first time in Bangladesh for the post-graduate students of applied chemistry and chemical engineering in various reputed national and multi-national industrial organizations. He also introduced the Advanced Level Course of London University (Edexcel) in 1980, with chemistry as the compulsory subject. He is known for his pragmatic approach in introducing innovative ideas to enrich the education sector.

As a scientist, Prof. Mustafa has research interests and expertise in diverse scientific disciplines, such as: environmental analytical chemistry; lipid chemistry; polymer chemistry; bio-ceramic materials, etc. He has a strong research network both at home and abroad – particularly, with several North American and European Universities. In Bangladesh, he has successfully implemented numerous research projects sponsored by reputed pharmaceutical and chemical companies, leading to the development of a number of new and novel products. As an academician, he has supervised 150 research students at Master's as well as M.Phil. and Ph.D. levels and published 130 research papers in reputed national and international scientific journals.

Being a professor of Applied Chemistry and Chemical Engineering at the University of Dhaka, Prof. Mustafa has held a number of high-profile positions, which include:

- i. Dean, Faculty of Engineering and Technology;
- ii. Chairman, Department of Applied Chemistry and Chemical Engineering;
- iii. Provost, Fazlul Huq Hall; and
- iv. Chairman, Blue Award Committee.

In addition to these positions, he has been affiliated as Expert/

Member with the following:

- i. Chemical Industries Development Cell, Bangladesh Shilpa Bank;
- ii. Higher Research in Chemical Sciences Section, University Grants Commission of Bangladesh;
- iii. Chemical Sciences Section of the Ministries of Science and Technology, and Education, Government of Bangladesh;
- iv. Member, BCSIR; and
- v. Bangladesh Standard and Testing Institution (BSTI).

Prof. Mustafa also worked as Consultant for several pharmaceutical and chemical companies in Bangladesh, including Advent Pharma Ltd.; Aristo Pharma Ltd.; and Global Heavy Chemicals Ltd. At present, Prof. Mustafa is also working as the Chairman of two Sectional Committees of BSTI on fats, oils & related products, and soaps & detergents.

Besides his engagements with various industrial enterprises, Prof. Mustafa is also associated with several public sector universities of the country. He is a member of the Regent Committee of the Jessore University of Science and Technology, and Pabna University of Science and Technology. He is also the syndicate member of Bangladesh University of Textiles Engineering; Islamic University Kustia; and Dhaka University of Engineering & Technology.

In recognition of his experience and outstanding performance, Prof. Mustafa has been conferred with many international awards, including: "One of the most outstanding people among 2000 of the 20th century", awarded by the International Biographical Centre, UK; and "International Man of the Year 1997". His name has been included in the Marquis "Who's Who"; Who's Who in the World; the Golden Scroll of Excellence; and the Dictionary of International Biography.

Prof. Mustafa has always worked for the collective well being of the scientific community and actively engages with many prestigious societies. He has held the positions of President, Bangladesh Society for Pharmaceutical Professionals; Vice-President, Bangladesh Chemical Society; and Member, Editorial Board of six national and international reputed journals.

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COMSATS' BRIEF AND ANNOUNCEMENTS

SELECTED FORTHCOMING SCIENTIFIC EVENTS IN COMSATS' COUNTRIES

21-23 September 2012	International Workshop on Nanotechnology, Dhaka, Bangladesh (www.univdhaka.edu/nano2012/)
04-08 October 2012	International Nanotechnology Festival (Iran Nano 2012), Tehran, Iran (www.festival.nano.ir/)
07-09 November 2012	8 th China International Exhibition on Water-Treatment Chemicals, Technologies and Applications, Shanghai, China (www.chinawaterchem.net/en/index.php)
30 Nov. - 2 Dec., 2012	International Conference on Frontiers of Mathematics and Statistics (ICFMS 2012), Lahore, Pakistan (www.ciitlahore.edu.pk/icfms/index.aspx)

COMSATS BEMOANS THE DEMISE OF THE PRESIDENT OF GHANA, DR. JOHN EVANS ATTA MILLS

The COMSATS' community joins the Government and people of Ghana in mourning the sad demise of the President John Evans Atta Mills, who was elected as the Chairperson of COMSATS in April this year. Dr. Mills died at the age of 68 of throat cancer, on July 24, 2012.

Having earned his Ph.D in Law from the School of Oriental and African Studies at the University of London, Dr. Mills had a teaching experience of over 25 years at University of Ghana, Leiden University (Holland), and Temple Law School (Philadelphia, USA), before taking on a political career. He became the President of Ghana in January 2009 and will be remembered for leading the country into a period of rapid economic growth and further solidifying the stability of one of Africa's model democracies. Under the able leadership of Dr. Mills, Ghana has joined the world community of large-scale oil producers.

Considering the death of Dr. Mills a great national loss for Ghana, the Executive Director COMSATS expressed sympathy and solidarity with the government and the people of the country in his message of condolence to COMSATS' Focal Point in Ghana and the Ghanaian Minister for Environment, Science & Technology, Ms. Sherry Ayyittey.



CALL FOR PAPERS FOR COMSATS' JOURNAL – SCIENCE VISION: VOL. 18

Science Vision is a biannual scientific journal of COMSATS. It primarily aims at highlighting the important scientific and technological developments that have a bearing on socio-economic conditions of the people. It invites research as well as review articles that have general scientific descriptions, with comprehensive elucidation of the impact of S&T discoveries and innovations for creating understanding of the contemporary issues and challenges.

COMSATS invites scholarly contributions for the Volume 18 (January to December 2012) of its journal. Scientists, researchers, policy-makers and young scholars from S&T organizations and R&D institutions are encouraged to contribute articles on any scientific field of interest relevant to the focus of the journal. As per the policy of the journal, contributors are compensated for their time and efforts with a modest amount of honorarium.

For more details, please visit COMSATS' official website: www.comsats.org or the journal's website: www.sciencevision.org.pk. Contributions may be sent to the Chief Editor at: comsats@comsats.org.

A BRIEF ON COMSATS

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

COMSATS, currently, has 21 countries as its members, spread across three continents, i.e. Africa, Asia and Latin America. A network, of 18 International Science and Technology Centres of Excellence, is also affiliated with COMSATS to contribute to scientific development of its Member States. For detailed information, please visit COMSATS' website: www.comsats.org.

COMSATS NETWORK OF INTERNATIONAL S&T CENTRES OF EXCELLENCE

- Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh
- Centro Internacional de Física (CIF), Colombia
- COMSATS Institute of Information Technology (CIIT), Pakistan
- Council for Scientific and Industrial Research (CSIR), Ghana
- Embrapa Agrobiologia, Brazil
- Higher Institute for Applied Sciences and Technology (HIAST), Syria
- Industrial Research and Consultancy Centre (IRCC), Sudan
- International Center for Chemical and Biological Sciences (ICCBS), Pakistan
- International Center for Climate & Environment Sciences (ICES), China
- International Centre for Environmental and Nuclear Sciences (ICENS), Jamaica
- Iranian Research Organization for Science and Technology (IROST), Iran
- National Mathematical Centre (NMC), Nigeria
- National Research Centre (NRC), Egypt
- Royal Scientific Society (RSS), Jordan
- Tanzania Industrial Research and Development Organization (TIRDO), Tanzania
- TÜBİTAK Marmara Research Center (MAM), Turkey
- University Cheikh Anta Diop (UCAD), Senegal
- The Biosphere Reserve – Beni Biology Station (BBS), Bolivia [Under Review]