

An Introduction to **COMSATS Coordinating Council** and the **Network of Centres of Excellence**



August 2016



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

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Sustainable Development in the South (COMSATS)**

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INTRODUCTION




It is very rare for an inter-governmental organization to be established without the backing of an umbrella political grouping or the patronage of a parent organization within UN system. COMSATS has the uniqueness of being totally independent and autonomous apex body. It is also non-political, non-regional and non-sectarian. These features have been possible to a large extent due to the fact that COMSATS is solely focused on a universal, non-factional and undisputed quest for using Science and Technology for human welfare in countries where it is needed the most. The second factor responsible for the emergence of COMSATS in its present form was the vision and drive of Pakistani Nobel Laureate, Prof. Dr. Abdus Salam. As a scientist and lobbyist for the promotion of Science and Technology, his world-wide respect and influence turned out to be the key factor for success in founding the organization in Pakistan. It was due to his acumen and experience of international scientific cooperation that he advised COMSATS to have an affiliated network of R&D organizations in different developing countries to be called the COMSATS International Network of Centre of Excellence. The pioneering role provided by his close associate in 'The World Academy of Sciences' (then named, 'The Third-World Academy of Sciences'), Prof. M. H. A. Hassan, in establishing such a Network is briefly described in the form of a historical note in the next chapter.



The Network activities are conducted by COMSATS Coordinating Council, which is also entrusted with a number of administrative powers pertaining to the work of the Organization as a whole, akin to those exercised by a Board of Governors, such as, approval of budget, approval of administrative actions taken by the Secretariat, and a role in the appointment of COMSATS' Executive Director. It is very significant that the Council comprises of the Heads of all Centres of Excellence. The ex-officio membership of the Council means that the tenure of Membership depends on holding the office of the Head of R&D organization, which is affiliated with COMSATS as its Centre of Excellence. Thus the ownership of the organization practically belongs to the R&D Centres in Member Countries or other developing countries. Currently there are 22 Council Members, including the Executive Director, who is also the Secretary of the Council, and the founder Chair of the Council as Honourary Life-time Member. The names and affiliations of Council Members along with their pictures are given in Table-1.

The Chairperson of the Council is elected from amongst the Council members for a term of three years. Multiple terms can be granted to any incumbent after a re-election on completion of tenure. Up to now only three persons have occupied this office; Prof. M. H. A. Hassan, from 1997 to 2010, Prof. Eduardo Posada F., from

Table-1: The list of COMSATS Coordinating Council Members as of August 2016

Name	Picture	Affiliation
Dr. Imtinan Elahi QURESHI		Commission on Science and Technology for Sustainable Development in the South (COMSATS), Islamabad, Pakistan URL: www.comsats.org
Prof. M.H.A. HASSAN		The World Academy of Sciences (TWAS), Trieste, Italy URL: www.twas.org
Mr. Md. Nazrul ISLAM		Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh URL: www.bcsir.gov.bd
Dr. Gustavo Ribeiro XAVIER		Embrapa Agrobiologia, Rio de Janeiro, Brazil URL: www.embrapa.br/agrobiologia
Prof. LIN Zhaohui		International Centre for Climate and Environment Sciences (ICES), Beijing, China URL: english.icces.ac.cn

Name	Picture	Affiliation
Dr. Eduardo POSADA F.		International Centre of Physics (CIF), Bogota, Colombia URL: www.cif.org.co
Prof. Dr. Ashraf SHAALAN		National Research Centre (NRC), Cairo, Egypt URL: www.nrc.sci.eg
Prof. Dr. Victor AGYEMAN		Council for Scientific and Industrial Research (CSIR), Accra, Ghana URL: www.csir.org.gh
Dr. Fathollah MOZTARZADEH		Iranian Research Organization for Science & Technology (IROST), Tehran, Iran URL: www.irost.org
Mr. Charles N. GRANT		International Centre for Environmental and Nuclear Sciences (ICENS), Kingston, Jamaica URL: www.icens.org
HRH Princess SUMAYA bint El Hassan		Royal Scientific Society (RSS), Amman, Jordan URL: www.rss.jo

Name	Picture	Affiliation
Prof. Dr. G. M. MUTANOV		Al-Farabi Kazakh National University (KazNU), Almaty, Kazakhstan URL: www.kaznu.kz/en/
Prof. Adewale Roland Tunde SOLARIN		National Mathematical Centre (NMC), Abuja, Nigeria URL: www.nmcabuja.org
Prof. Dr. M. Iqbal CHOUDHARY		International Center for Chemical and Biological Sciences (ICCBS), Karachi, Pakistan URL: www.iccs.edu
Dr. S.M. Junaid ZAIDI		COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan URL: www.ciit.edu.pk
Dr. G.A.S. PREMAKUMARA		Industrial Technology Institute (ITI), Colombo, Sri Lanka URL: www.iti.lk
Dr. Widad Hassan Abdel Halim HASSAN		Industrial Research and Consultancy Centre (IRCC), Khartoum, Sudan URL: www.ircc.gov.sd

Name	Picture	Affiliation
Prof. Ibrahima THIOUB		Université Cheikh Anta Diop de Dakar (UCAD), Dakar, Senegal URL: www.ucad.sn
Dr. Maher SOLEIMAN		Higher Institute for Applied Science and Technology (HIAST), Damascus, Syria URL: www.hiast.edu.sy
Prof. Mkumbukwa Madundo Angelo MTAMBO		Tanzania Industrial Research and Development Organization (TIRDO), Dar-es-Salaam, Tanzania URL: www.tirdo.org
Prof. Ahmed GHRABI		Water Researches and Technologies Centre of Borj-Cedria (CERTe), Soliman, Tunisia URL: www.certe.rnrt.tn
Dr. Bahadır TUNABOYLU		TUBITAK Marmara Research Centre (MAM), Gebze Kocaeli, Turkey URL: www.mam.gov.tr

2010 to 2016, and Prof. Dr. Shaalan (at present). Considering that all Council Members are distinguished academics with extended scientific and administrative experience, the Council meetings are a potent occasion of generating South-South Cooperation in fields of common interest in different organizations of the Network. It is a matter of great satisfaction that the Council has been meeting most regularly, once every year, in different Centres of Excellence. The host of the Council meeting changes every year based on the hosting offers received from the Centres of Excellence, which are considered in the closing session of the Council meeting. As of 2016, nineteen meetings of the Council have been held since the inception of COMSATS in 1994. A list of these meetings with dates and venues are given in Table-2.

Group photos of the participants of individual meetings are given under the profiles of relevant Centres of Excellence where the activities took place (Chapter 3).

Table-2: The list of Coordinating Council meetings, with dates and venues in reverse chronological order		
Meetings	Dates	Venues
The 19 th Council meeting	May 17-18, 2016	Islamabad, Pakistan
The 18 th Council meeting	May 12-13, 2015	Colombo, Sri Lanka
The 17 th Council meeting	May 19-20, 2014	Tehran, Iran
The 16 th Council meeting	May 02-03, 2013	Accra, Ghana
The 15 th Council meeting	May 24-25, 2012	Gebze, Turkey
The 14 th Council meeting	May 26-27, 2011	Bogota, Colombia
The 13 th Council meeting	May 12-13, 2010	Trieste, Italy
The 12 th Council meeting	April 28-29, 2009	Abuja, Nigeria
The 11 th Council meeting	June 24-26, 2008	Beijing, China
The 10 th Council meeting	June 18-19, 2007	Cairo, Egypt
The 9 th Council meeting	March 1-2, 2006	Amman, Jordan
The 8 th Council meeting	March 14-15, 2005	Cairo, Egypt
The 7 th Council meeting	March 14-15, 2004	Islamabad, Pakistan

The 6 th Council meeting	May 9-10, 2002	Islamabad, Pakistan
The 5 th Council meeting	Sept. 19-20, 2000	Islamabad, Pakistan
The 4 th Council meeting	Dec. 6-7, 1999	Beijing, China
The 3 rd Council meeting	Nov. 20-21, 1998	Islamabad, Pakistan
The 2 nd Council meeting	Oct. 6-7, 1997	Islamabad, Pakistan
The 1 st Council meeting	Nov. 14-15, 1995	Islamabad, Pakistan

The objectives of the Network, laid down in the Charter of COMSATS are as follows:

- a. To assist the countries of the South to build and sustain a critical mass of world-class scientists and technologists in those areas of science and technology, which are of critical importance to sustainable socio-economic development;
- b. To attract talent, reduce brain-drain, and induce competent Third World scientists and technologists working abroad to return to their countries;
- c. To facilitate the transfer of technology and the supply to industry of highly qualified technical personnel;
- d. To assist in finding S&T-based solutions to sustainability issues in the South;
- e. To provide avenues for international cooperation in areas of science and technology of global concern, including those for environmentally sustainable development;
- f. To provide a suitable framework for science and technology assessment and management in the South;
- g. To develop strong links between Members of the Network and production sectors in the South;
- h. To promote joint scientific research and technological ventures of common interest amongst the Members of the Network;
- i. To assist in carrying out other programmes as assigned by COMSATS.

In pursuit of these objectives, the Council has constituted the following framework:

1. Organization of Conferences and Symposia on emerging sciences, such as nanotechnology.
2. Conducting of training workshops in areas of economic significance such as internet security.
3. Holding hands-on workshops for repair and maintenance of scientific equipment in laboratories of R&D organizations, small industry, educational institution etc. in Member States.

4. Helping scientists to build capacity and create networking through participation in international scientific events sponsored by COMSATS.
5. Establishment of five 'International Thematic Research Groups' with multinational participation in areas of communication, environment, mathematical modeling, natural medicines and agriculture.
6. Constituting a panel of experts on Science Policy.
7. Launching the Scheme of COMSATS Distinguished Professorship for giving invited lecture/short courses.
8. Establishing a Science Diplomacy programme for popularization, advocacy and support on Science related national and international affairs.
9. Offering scholarships for graduate studies at selected Centres of Excellence.
10. Establishment of a COMSATS Science Technology Park (in Process).

The overall relationship of the Coordinating Council with other organs in COMSATS system is demonstrated in the following diagram (Figure-1).

As indicated in Figure-1, the work of the Council deals with grass root scientist-to-scientist interactions, while the governmental support of Member States is derived through the forum of Consultative Committee. The Commission as the apex body is represented by the Heads of State/Government through their relevant Ministers



Figure-1: A pattern of COMSATS' forums with the broad specification of their roles in the system

providing political patronage. The role of Technical Advisory Committee is to provide technical advice to the Council. Thus, the Coordinating Council has a pivotal position in the organization and all other organs play supportive roles.

The annual meeting of the Council as a gathering of a group of science leaders in 20 developing countries is always an auspicious occasion to exchange notes on the potentials and prospects of Network organizations in areas of S&T, that are being pursued in these Centres. The central agenda item of the meeting is a series of presentations by each of the Council Members about the achievements of his/her organization during the preceding year. These presentations offer opportunity to other Heads of Organizations to learn as well as to suggest what can be done in different disciplines of science. If there is a subject of interest to one or more Members, there is always the possibility of further consultations or cooperation after the meeting. The Council provides an atmosphere of free exchange of ideas, discussions, proposals, offers and requests of S&T cooperation. The sharing of views and learning from each other's best practices afforded by Council meetings is in itself effectively a mechanism of South-South cooperation. Any follow-ups in the form of bilateral consultations, visits, MoUs is left to the discretion of relevant Networks Members. A special bonus of holding the meeting in a different Centre of Excellence each year is the possibility of having first-hand knowledge of the R&D activities taking place in the hosting institutions. Indeed, the programme of the Council meeting always has a component of physical visit to the Laboratories of the host organization as well as any others that may be of interest to the Council Members. A deeper understanding of the S&T system, as well as direct interaction with working scientists and engineers emerges during these visits. Element of emulation are silently picked or discrete advice given by visitors making the bonus extremely attractive. The working scientists of the laboratories being visited are always glad to showcase their work to the distinguished guests and to have the opportunity of meeting their senior peers in other developing countries.

COMSATS takes prides in making all that possible, along with its litany of other avenues of S&T promotion in Member States, such as holding of conference, workshops, training programmes, multi-national group research, scholarships facilitation and scientific exchanges. COMSATS Council does not measure its strength in terms of dollars given out, but the avenues opened and help extended for the Member of the Council to help each other. In the following pages, the profiles of each of the Network Institutions are given along with the level of their participation in COMSATS activities, and a brief introduction of Heads of the Institutions, who are ex-officio Members of the Council.

Dr. Imtinan Elahi Qureshi
Executive Director COMSATS

HISTORICAL NOTE

The history of COMSATS' Network of Centres of Excellence dates back to 1990 when the late Nobel laureate Prof. Abdus Salam got fascinated by the international network of Centres of Excellence operating under the umbrella of the Consultative Group for International Agricultural Research (CGIAR). It is a network of 16 International Centres of Excellence in Agricultural Sciences, scattered around the developing world. CGIAR is currently operating with a budget of over one billion dollars.



The CGIAR model prompted Salam to think about establishing a similar network of Centres of Excellence in various fields of Science and Technology. Salam then moved swiftly to get the World Bank, the main sponsor of the CGIAR, to also agree to sponsor a similar network of 20 Centres of Excellence in Science and Technology. I travelled with him to Washington in 1991 to meet with his friend, Dr. Moin Qureshi, who was then the Senior Vice president of the Bank. Dr. Qureshi facilitated all meetings between Salam and the Senior Economists of the World Bank. But, unfortunately, the Economists at the Bank did not see the benefit of establishing brand new Centres of Excellence in Science and Technology, as at that time the World Bank was not even regarding supporting higher education as a priority. So they reluctantly said 'No' to Salam but they indicated to him that perhaps he should think about strengthening institutions in developing countries, and that he should think about doing it in collaboration with the governments of the developing world.

When we came back to Trieste, Salam started to think about what to do next. He liked the idea of strengthening institutions, and he liked the idea of engaging governments. He then started to mobilize governments in developing countries, not only to establish a Network of Centres of Excellence in Science and Technology by strengthening the best institutions in different countries, but also to support Science and Technology in the South at a broader scale. He thought about a forum of the Heads of State or Government that could bring together all governments to support this idea. The various discussions we had with Salam resulted in the proposal to setup a Commission of Heads of State/Government to back up the core agenda of supporting Science and Technology in developing countries, especially the strengthening of a number of prominent institutions in these countries and scaling-up their operations and academic standards to world-class levels.

Salam then moved to get the approval of the General Assembly of TWAS at its 1992 meeting in Kuwait. The following year, TWAS organized a major event in Trieste to celebrate its 10th Anniversary, and it was at that meeting a decision was taken to organize the foundation meeting of COMSATS and the launching of the Network of Centres of Excellence in Pakistan. The Prime Minister of Pakistan, Ms. Benazir

Bhutto, very much appreciated the idea and, in late 1994, the meeting was held in Islamabad in the presence of the Prime Minister and a large number of Ministers responsible for Science and Technology, representing their Heads of State/Government. The meeting approved the establishment of COMSATS and endorsed the statutes governing the functioning of the Network of Centres, as well as agreeing on the proposed first nodes of the Network.

The Centres of Excellence accepted as members of the Network were first proposed by governments and were selected on the basis of merit and detailed reports by a team of world-class experts appointed by TWAS. Each Centre was visited by two experts who submitted their report after concluding their two-week long visit to the Centre.

An important feature of the new network is that it gives ownership of the Centres, being identified for scaling-up to international standards, to the host countries, which makes it different from the CGIAR system. To that effect, the sustainability of COMSATS' institutions relies heavily on the generosity of the host country. Some of the centres selected initially as members of the Network, such as HEJ Research Institute of Chemistry (now International Center for Chemical and Biological Sciences (ICCBS)), Karachi, Pakistan and the International Center for Climate and Environment Sciences (ICCES), Beijing, China, have already reached international levels, with a large portion of their budget being provided by their governments. In addition, they have also succeeded in getting substantial support from abroad for specific activities

That in my view is the biggest success of COMSATS' Network of Centres initiative; being able to identify a number of such institutions that are doing extremely well and trying to find ways and means to successfully increase the scale and scope of their operations, keeping them working largely within the funds provided by their respective governments.

Dr. M.H.A. Hassan
Former Chairperson
(and Honorary Life-time Member)
COMSATS Coordinating Council &
Co-Chair
IAP- the Global Network of
Science Academies
Trieste, Italy

Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh

Introduction

The Bangladesh Council of Scientific and Industrial Research (BCSIR) is the only multidisciplinary public-research institute of the country, which was established in 1973. BCSIR is an autonomous organization under the control of the Ministry of Science and Technology, Government of Bangladesh. The functions of BCSIR are being conducted under the overall control and supervision of its Chairman. All the full-time members of the Council assist the Chairman in providing general guidelines to, and overseeing the activities of the Council. The Council is governed by its Board, and the policy formulation is made by the Advisory Council headed by the Honorable Minister, Ministry of Science and Technology, Government of Bangladesh.



Since the beginning, BCSIR has been performing scientific and industrial research for achieving self-reliance in industrial development of the country. Being the leading R&D organization of Bangladesh, BCSIR executes R&D work in accordance with the national needs, and is contributing in accelerating the economic growth. Indeed, BCSIR is acting as the 'Centre of Excellence' for research and development and playing a vital role to improve the socio-economic conditions of the country.

Objectives

The objectives of the Council are to:

- initiate, promote and guide scientific, industrial and technological research having a bearing on problems related to the establishment and development of industries that the Government may refer to the Council;
- establish, maintain and develop laboratories, workshops, institutes, centres, and enhancement of scientific and industrial research with the objective of utilizing and exploiting the natural resources of the country in the best possible manner;



- give grants-in-aid for scientific, industrial and technological research schemes and projects of the universities established by the Government and other research institutions;
- adopt measures for the commercial utilization of discoveries and invention resulting from the research carried out by the Council, universities or by any other research organization;
- establish and award fellows in areas of research covered by the Council;
- collect and disseminate information of scientific, industrial and technological matters, and publish scientific papers, reports and periodicals on such matters;
- encourage establishment of industrial research organizations;
- maintain contact with scientific, industrial and technological research organizations of other countries;
- register patents and make arrangements for the industrial utilization of research processes developed in the institutes and laboratories established by the Council; and
- establish libraries, museums, experimental plantations and herbaria as the Board may consider appropriate.

Units of BCSIR

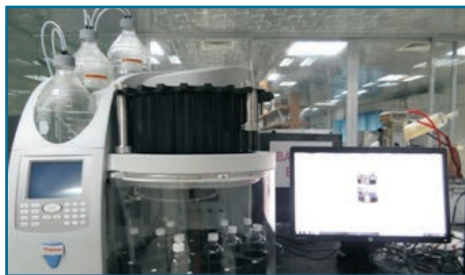
BCSIR comprises of three multidisciplinary regional and seven mono-disciplinary laboratories. These include:

- i. Institute of Fuel Research & Development (IFRD);
- ii. Institute of Food Science & Technology (IFST);
- iii. Institute of Glass and Ceramic Research & Testing (IGCRT);
- iv. Leather Research Institute (LRI), Savar;
- v. Institute of Mining, Mineralogy and Metallurgy (IMMM), Joypurhat;
- vi. Pilot Plant and Process Development Centre (PP&PDC);
- vii. Designated Reference Institute for Chemical Measurements.

Another new unit 'Institute of National Analytical Research and Service' has been established under the BCSIR Laboratories, Dhaka. Shortly, this Institute will function independently. This Institute is equipped with most sophisticated scientific equipment and supported by talented scientists.

All the units are largely pursuing applied research with necessary basic research. Director of each unit is responsible to run the unit smoothly and coordinate R&D plans and programmes of their respective unit. Apart from regular R&D assignments, all the units are also





executing aided projects, technical assistance projects and various development projects, under the annual development programme (ADP) of the Government of Bangladesh. Director, Planning and Development Division (P&D) of BCSIR coordinates ADP and foreign aided projects. All the units of BCSIR are fully equipped with state-of-the art equipment to facilitate research activities enabling them to compete globally.

The research being undertaken at BCSIR is in the fields related to: biomass, biotechnology, food and nutrition, glass and ceramics, leather and footwear, mining and metallurgy, textile, natural products, renewable energy, etc.

At present five (5) ADP projects are running. Under these projects, a few laboratories have been built that include:

- Fibre and Polymer laboratory;
- Biomedical and toxicological laboratory; and
- Solar cell laboratory.

New projects under in consideration of the Government of Bangladesh. One of these projects involves building an international centre, which would include international guest house, conference hall, cafeteria, and gymnasium.

Recent Developments at BCSIR (last three years)

- i. BCSIR has handed over 50 technologies to entrepreneurs and developed 41 new technologies.
- ii. BCSIR scientists have published 250 research articles in different national and international journals and patented 18 technologies.
- iii. BCSIR has provided 150 postgraduate fellowships to young researchers for developing the human resources of the country. Three hundred fifty (350) M.Sc students of different universities have completed their theses at BCSIR under the joint supervision of scientists from the university and BCSIR.
- iv. Designated Reference Institute for Chemical Measurements (DRICM) of BCSIR got full membership of Bureau International des Poids et Mesures (BIPM)-Paris-based highest international organization on chemical metrology and Asia Pacific Metrology Program (APMP).
- v. BCSIR has signed Memoranda of Understanding with CSIRO-Australia, CSIR-India, CNPPRI- China and Belarus in the field of science and technology.

- vi. BCSIR has provided training to 450 scientists to help improve their professional skill.
- vii. BCSIR has provided analytical services for 13,500 samples through one-stop service.

Success Story of BCSIR

BCSIR has made a number of achievements including:

- i. Reduction in the greenhouse gases emission, as improved cooking stove and biogas technology were developed in BCSIR and successfully disseminated in different parts of Bangladesh through different projects.
- ii. BCSIR developed partex board from jute stick, which is called 'MBF'. In the way of this development, different particle board mills have been built.
- iii. BCSIR has entered into the world market, receiving the ISO 17025 accreditation to analyze twenty four (24) water quality parameters.
- iv. Improvement of developed 'Iodine test kit' to detect iodine upto 3ppm level and 'Formalin Test Kit' to detect formalin in fish and milk are also noteworthy achievements of BCSIR scientists.
- v. Institute of Fuel Research and Development of BCSIR received National Environment Award (2013) for improved cooking stove and same institute also received National Electricity Award 2013 for biogas technology.
- vi. Cost-effective and easy-to-use 'Arsenic testing kit' and arsenic removal filter have been developed by its scientists, and at present it is designated as the only government agency in Bangladesh responsible for the performance verification of arsenic removal technologies, to be marketed in the country.
- vii. BCSIR scientists have received numerous international scientific awards in last three years.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Mr. Md. Nazrul Islam, Chairman BCSIR, Bangladesh

Md. Nazrul Islam obtained his B.Sc (Hon's) in Zoology and M.Sc (Special Entomology) degree from the University of Rajshahi, Bangladesh. After completion of MSc. he served in an internationally reputed pharmaceutical company Smith Kline & French, Bangladesh, for one year. Then he got appointed himself as Senior Officer of Bangladesh Krishi Bank, a Government owned financial and development institution for one year. Afterward he joined Bangladesh Civil Service (Administration Cadre) as Assistant Commissioner and Magistrate in 1986.



Now Mr. Islam is an Additional Secretary to the Government of Bangladesh and posted as Chairman of BCSIR on deputation. In way to Additional Secretary from Assistant Commissioner and Magistrate he was promoted as Senior Assistant Secretary, Deputy Secretary and Joint Secretary to the Government. He enjoyed Magistracy power of first class and disposed off many criminal cases in the criminal court. After separation of judiciary in 2009 Mr. Islam chose executive rather than judiciary with executive magistracy power of first class. He can exercise executive magistracy power when Government of Bangladesh desires.

In early stage of his job in the Bangladesh Civil Service he was to perform multifarious types of work like Officer in Charge of different section like Trade & Commerce, Education, Judicial Munshikhana, Treasury, Special Passport, etc, of Deputy Commissioner and District Magistrate's office. Mr. Islam worked as General Certificate officer to recover Government dues from different types of defaulter borrower disposing Certificate Cases at civil court. He performed a fantastic job for maintenance law and order as a leader of a team that consists of Police, Border Security Force and Army personnel.

He served as Assistant Commission (Land) in two different Upozila (Field level administrative unit/area with more or less 3,00,000 people) for land management and collection of revenue. He served as Upozila Nirbahi Officer, the chief executive, of three different Upozila for about seven years, where he had to co-ordinate development and social activities like health, education, agriculture, livestock, fisheries, sanitation, infrastructure (Road, bridge, culvert, school/collage building etc.) and control law and order as well as land management and collection of revenue. Mr. Islam served in the Department of Narcotics under Ministry of Home as Deputy Director to administer and control narcotics & liquor.

He served as Additional Deputy Commissioner and Deputy Commissioner in charge for two years in a district. Deputy Commissioner is the chief executive and co-ordinator of a district (Bangladesh consists of 64 districts) and he himself is also District Magistrate and Collector (of land revenue). Deputy Commissioner performs more than 100 different type of works.

Mr. Islam served as Chief Executive Officer of different District Council, an important tier of Local Government system about five years. District Council performs multifarious job like Education, Health, Religion, Connectivity, Park, Ferry, Rest House, plantation, etc. He also served as Zonal Executive Officer of Dhaka (Capital City) City Corporation the largest Local Government Organization of Bangladesh.

In City Corporation Mr. Islam was responsible for deliver all kind of services to the citizen and enjoyed Magistracy power for maintenance law and order, eviction of unlawful/unauthorised occupant and hold mobile court under different criminal Laws.

Before joining as Chairman of BCSIR Mr. Islam was Member (Admin instruction & Planning) of Chittagong Sea Port, the largest Sea Port of Bangladesh more than five years. During his service in the Port he had done potential jobs among which the important are: (a) drafting a new law for a new sea port named Payra Sea Port which was inaugurated by honourable Prime Minister of Bangladesh in 2012; (b) formulation a new tariff for Chittagong Sea Port and Pangaon Container Terminal; (c) modify and make updated rules and regulation under Port Act.; (d) formulation of policy for establishment & operation of private owned Container Depot; (e) arrangement and signing of tetrapartiate MoU between labour leaders (CBA), stevedor, Chittagong Port and Ministry of Labour; (f) long term negotiation regarding fees of services between Shipping Agents Association and port users like exporter, importer, chamber of commerce, clearing and forwarding agent, freight forwarder, private owned container depot association, etc.

Chittagong Port has been upgraded its position from 98 to 76 among top 100 ports in the world within last 5 years. Chittagong Port handle 92% of sea borne trade of Bangladesh and play a vital role for growth of Bangladesh economy and fostering trade and commerce.

Chairman of BCSIR Md. Nazrul Islam took different training and attended a number of seminar in home and abroad. Important once are

- a) foundation training, (2.5 month),
- b) military training (2 month),
- c) survey & settlement training (2 months),
- d) law and administration training (2 month),
- e) advance course on administration & development (2.5 months, home and abroad),
- f) port management and operation (2 week, abroad),
- g) managing at the top-2 (2.5 month, home and abroad),
- h) policy planning & management course (1.5 months, home and abroad).

Contact Details:

Mr. Md. Nazrul Islam

Chairman

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Participation in COMSATS' Activities

Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh

1. Date of Affiliation to COMSATS: 27th May 2011
2. Participation in COMSATS' Coordinating Council Meetings: BCSIR has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
15 th Meeting	Prof. Dr. Ahmad Ismail Mustafa, Chairman BCSIR
16 th Meeting	Prof. Dr. Ahmad Ismail Mustafa, Chairman BCSIR
17 th Meeting	Mr. F. M. M. Jalaluddin Al-Quaderi, Member (Additional Secretary), BCSIR
18 th Meeting	Dr. Parvin Noor, Director (In Charge), Institute of Glass and Ceramic Research and Testing (IGCRT), BCSIR

3. Participation in COMSATS International Conferences/Symposium/Workshops:
Number of Participants: 8
4. Participation in COMSATS' International Thematic Research Groups (ITRGs):
BCSIR-Bangladesh is participating in the following research projects of ITRGs:
 - "Biotechnological Approaches to Improve some Wheat Lines Productivity under Biotic and Abiotic Stresses" being executed by the ITRG on 'Agriculture, Food Security, and Biotechnology', and led by National Research Centre (NRC), Egypt; and
 - "Enabling ICT Applications using Long Distance Wi-Fi Networks" being executed by ITRG on 'Information and Communication Technologies' and led by COMSATS Institute of Information Technology (CIIT), Islamabad.
5. Participation in COMSATS' Publications:
 - i) COMSATS Newsletter: Profile of BCSIR was published in COMSATS Newsletter Volume 3: Issue No 4 (Jul-Aug 2011) and profile of Chairman of BCSIR was published in COMSATS Newsletter Volume 4: Issue No 4 (Jul-Aug 2012).
 - ii) COMSATS' Journal 'Science Vision': Research article received from BCSIR-Bangladesh was published in COMSATS' Journal 'Science Vision', Vol. 16 and Vol. 17.

Embrapa Agrobiologia, Brazil

Introduction

Embrapa Agrobiologia, Brazil, has its origins in the research initiated by Dr. Johanna Döbereiner in 1951. As a young scientist she started work on biological nitrogen fixation (BNF) in the Soils Laboratory of the National Centre for Agronomic Education and Research at the Seropédica Campus of the Federal Rural University of Rio de Janeiro. Over the years, she gathered a dedicated team of students and young researchers from the University. Her lab became a centre of reference for work on BNF, both in Brazil and overseas. The team gradually expanded and was adopted by Embrapa (the Research Corporation of Ministry of Agriculture of Brazil), which was founded in 1973.



Embrapa Agrobiologia comprises 47 research units in its network. The work at the centre has led to greater emphasis on research and development of sustainable agricultural systems with reduced global, regional and local environmental impacts. Today, the Centre is recognized nationally and internationally for its excellence in technical and scientific contributions and technologies generated in BNF, organic agriculture, greenhouse gas emissions (GHG) by agriculture activities, land reclamation and biotechnology.

Mission

The centre has the mission to provide solutions for research, development and innovation for sustainability of agriculture for the benefit of Brazilian society. A corporation of research, development and innovation, the agenda is completely directed to new knowledge generation; a great deal of it transformed into products, processes and services for the agricultural sector.



Scientific Capacity

Embrapa Agrobiologia has a total area of 862 hectares and an infrastructure that includes a historic building, as well as a research pavilion, 6 greenhouses, 19 laboratories, a library and a restaurant, in addition to land for experimental fields. It



currently has 154 employees that include 43 researchers, 44 analysts, 28 technicians and 39 assistants. The Centre is currently leading 27 projects financed by Embrapa and other development agencies. Furthermore, it has partnership in another 36 projects related to research activities and technology transfer. Over the years, the Centre has hosted students from European and African countries and, most frequently, from almost all other Latin American countries.

Since 1993, in cooperation with the Federal Rural University, and the Rio de Janeiro and State Agricultural Research Company of Rio de Janeiro (Pesagro-Rio), the Centre has developed an organic production unit (Agroecological Small Farm). This Small Farm develops many organic crop-production systems for horticulture, shade-grow coffee production, and other food crops produced by family agriculture. A great emphasis has been laid on organic production in integrated systems, including animal products, such as milk.

Recent R&D Activities and Achievements

- In a formal agreement with a private partner, Embrapa Agrobiologia is developing inoculants for sugarcane. Promising strains of rhizobia for inoculants development for corn, elephant grass, green manures and leguminous trees species were also isolated and tested over the last three years. Recent data show that the benefits of these inoculants are not restricted to BNF as it brings other advantages to crops by promoting the roots and shoots growth. As a consequence of these studies, the Centre holds one of the leading collections of nitrogen-fixing bacteria and other beneficial microorganisms.
- Embrapa Agrobiologia has pioneered the measurement of GHG emissions, particularly nitrous oxide, in different production systems and biomes. Initial results already published show that nitrous oxide emissions from production systems are lower than those provided by the IPCC's data, knowledge already incorporated into the calculations of the national inventory. In the livestock case, it was shown that the excreta of cattle also emit lower amounts of N_2O , especially in the Cerrado (Brazilian savannah), which results in a 10% reduction of total GHG emissions in the Brazilian Agriculture Inventory. Another important result arising from this research relates to the process of soil carbon sequestration, which requires nitrogen incorporation in organic form more easily supplied by BNF. It has been shown that the use of leguminous plants such as green manure in the crop rotation at conservative agriculture can promote



increments of 10 to 15% in soil carbon reserve over 15 to 20 years. All these findings have strategic influence on Brazil's place in international consumer market, which is sensitive towards environmental impacts of production systems.

- In the last three years, Embrapa Agrobiologia and its partners have developed inputs and agricultural practices to improve soil fertility. Rhizobacteria strains were selected to control pathogenic fungi in vegetables and efforts have been made to biologically control pests.
- The technologies for land reclamation and ecological restoration developed by Embrapa Agrobiologia are based on the use of leguminous tree species, inoculated with nitrogen-fixing bacteria and mycorrhizal fungi. This triple combination allows the reforestation of severely impacted areas. Recent advances at Embrapa Agrobiologia in this area related to the reclamation of degraded areas by gravel extraction, at Caatinga (semi-arid Brazilian region), and gullies reclamation technology.

International Cooperation

Since its inception, Embrapa Agrobiologia has maintained widespread international exchanges and partnerships. Students and researchers from all over the world have attended short and long-term training under various research programmes of the Centre. Embrapa Agrobiologia has been one of the Centres of Excellence of COMSATS for over 20 years. The Centre maintains cooperation with international organizations, such as FAO, IAEA, as well as scientific institutions in Argentina, Belgium, Colombia, England, France, Germany, Ghana, Mexico, Portugal, Scotland, Spain and USA. Some of its partner institutions include: Catholic University of Leuven (Belgium); University of Buenos Aires, National University of Salta (Argentina); German Research Center for Environmental Health (Germany), University of Puebla (Mexico); University of York (England); The James Hutton Institute (England); CORPOICA (Colombia), CIRAD (France), AGRA (Ghana), University of Dundee (Scotland), and USDA (USA).



For further details, please contact:

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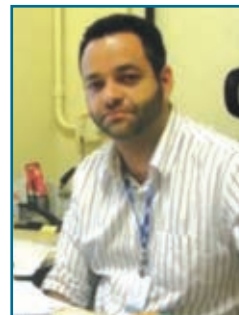
URL: embrapa.br/agrobiologia



Profile of Head of COMSATS' S&T Centre of Excellence

Dr. G.R. Xavier, Director General, Embrapa Agrobiologia, Brazil

Dr. Gustavo Ribeiro Xavier succeeded Dr. Eduardo Carneiro Campello Francia, as the Director General of the National Centre for Research in Agrobiology (EMBRAPA Agrobiologia) on November 13, 2013, which is one of the 47 decentralized units of the Brazilian Agricultural Research Corporation (Embrapa), under the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA). The Centre which is also COMSATS' Centre of Excellence is nationally and internationally known for its technologies generated in biological nitrogen fixation (BNF) and organic agriculture as well as excellence in technical and scientific contributions.



Dr. Xavier has been associated with the Brazilian Agricultural Research Corporation as researcher since 2002. His areas of scientific interest are Biosafety of GM crops, Microbial Ecology, and Biological Nitrogen Fixation. He has dedicatedly contributed to Embrapa Agrobiologia in different scientific and administrative positions. Now as the administrative head of Embrapa Agrobiologia, he is leading a team of over 150 employees, comprising 43 researchers and 40 analysts. Dr. Xavier provides leadership to national and international collaborative projects with Embrapa; Carlos Chagas Filho Foundation for Research Support of the State of Rio de Janeiro (FAPERJ); National Council for Scientific and Technological Development (CNPq); and CAPES – a department under the Brazilian Ministry of Education, devoted to funding and evaluation of graduate education in the country.

Gustavo Ribeiro Xavier graduated in Agronomy in 1996 from the Federal Rural University of Rio de Janeiro (UFRRJ), Seropédica, Brazil. He did his Masters and Ph.D from the same institution in Agronomy (Soil sciences) in 2000 and 2003, respectively. His Ph.D research focused on analysis of the bacterial community of soil associated with the 'oleraceous' cultivated by organic production by Single Strand Conformation Polymorphism (SSCP). He received specialized training in Molecular Techniques in 2002, which was patronized by German Federal Ministry of Education and Research (BMBF).

Dr. Xavier is a soil microbiologist for projects related to research, development and innovation & technology transfer. As a researcher, he has actively contributed to R&D work in the areas of soil microbiology and biochemistry; molecular microbial ecology; and molecular genetics of plants. Dr. Xavier was part of the testing of environmental impact assessment project that supported the evaluation of Brazilian National Biosafety Technical Commission (CTNBio) in relation to Embrapa's transgenic beans, resistant to the golden mosaic virus (2011).

He has been the Executive Secretary to the Working Group for Planning Portfolio Projects in Biological Nitrogen Fixation (since 2013), which is a thrust area of the Centre; Investigator for the Technical Cooperation Programme with Agriculture Research Cooperation of the State of Rio de Janeiro (Pesagro-Rio) since 2006; Member of Intellectual Property Committee since 2003; Deputy Head of Technology Transfer from April 2011 to June 2013; and Executive Secretary to the External Advisory Committee (2011-2013). Moreover, he undertook short international assignments in Mexico (2010) to explore cooperation between Brazil and Mexico; Argentina (2007) to deliver lectures at the University of Buenos Aires; and Germany (2003) to conduct short training in Dr. Christoph C. Tebbe laboratory in Braunschweig.

As an academician, he is currently supervising five PhD students and one post-doctoral fellow, while in the past he has supervised 10 Masters and 6 PhD students, as well as 3 Post-doctoral fellows. Dr. Xavier has to his credit 51 scientific publications with a citation of 54 on the 'Web of Science'. He has contributed several book chapters, newspaper articles, and presented papers in numerous scientific conferences at international fora. Dr. Xavier has also co-authored several scientific literatures, technical product manuals, curriculum contributions, and wrote on scientific processes and techniques pertinent to his work.

Dr. Xavier is the recipient of a number of institutional awards and titles in recognition of his scientific contributions and excellence, mostly by his principle institution and its parent body. Some of these include: National Awards for projects on Scientific and Technological Development of Organic Agriculture in Brazil (2011) and Processing organic waste through management of soil fauna (2011) by Embrapa; Four of Johanna Döbereiner Awards for highlighted scientific work under different categories in 2011; Title of Young Scientist (Agricultural sciences) in 2008 by the Brazilian Academy of Sciences, as well as UFRRJ Award for Scientific Initiation by Federal Rural University of Rio de Janeiro.

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Participation in COMSATS' Activities

Embrapa Agrobiologia, Brazil

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: Embrapa Agrobiologia has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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8 th Meeting	Dr. Helvécio De-Polli, Pesquisador (Research Scientist), Embrapa Agrobiologia
13 th Meeting	Dr. Eduardo Campello, Director General, Embrapa Agrobiologia
14 th Meeting	Dr. Eduardo Campello, Director General, Embrapa Agrobiologia
16 th Meeting	Dr. Robert Michael Boddey, Research Scientist, Embrapa Agrobiologia

3. Participation in COMSATS' Publications:
 - i) COMSATS Newsletter Profile of Embrapa Agrobiologia was published in COMSATS Newsletter Volume 2: Issue No 4 (Jul-Aug 2010) and profile of Director-General Embrapa Agrobiologia was published in COMSATS Newsletter Volume 6: Issue No 3 (May-Jun 2014).
 - ii) COMSATS' Journal 'Science Vision': Research article received from Embrapa Agrobiologia was published in COMSATS' Journal 'Science Vision', Vol.2, No.2.

International Center for Climate and Environment Sciences (ICCES), China

Introduction

The International Center for Climate and Environment Sciences (ICCES), China, was established in 1991, in order to meet the urgent need of solving climate and environment related problems. Since its establishment, ICCES has been continuously supported by Chinese Academy of Sciences (CAS), Ministry of Science and Technology (MoST), National Natural Science Foundation, and Ministry of Finance of China. In 1994, ICCES was selected as the representative centre of China to join COMSATS, and was subsequently designated as the 'Centre of Excellence of COMSATS'. In 2013, ICCES was certificated as the CAS-TWAS centre of excellence for climate and environment sciences.



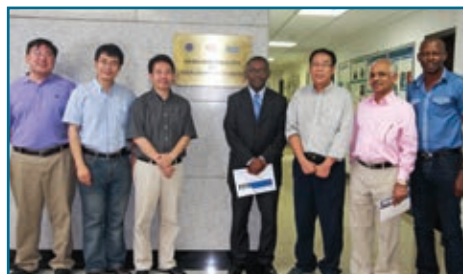
Vision

The goal of ICCES is to become an internationally renowned cooperative and innovation research center on global climate and environment sciences, and to provide services to the developing countries with scientific support and consultation and capacity-building.

Mission

The mission of ICCES includes the following four aspects:

- conducting research on the key scientific problems in global climate and environmental changes, and providing consultancy for scientific policies in the negotiation of global climate change;
- enhancing the forecast capability for climate and environmental disasters, to meet the national and international requirements of sustainable development;
- organizing the CAS-TWAS-WMO Forum (CTWF) international training workshops, and providing exchange programmes for visiting scholars and students from developing countries;
- fostering international cooperative programmes in the area of climate and environmental change to improve the understanding of climate change science, as well as the experiences of management and adaptation in developing countries.



Currently, ICCES comprises of 48 staff members, including 14 professors; 11 associate professors and 17 assistant professors; and 2 senior engineers. There is also one academican of Chinese Academy of Sciences deputed at ICCES. Currently, there are total 40 graduate students studying at ICCES, including 3 international Ph.D. students supported by CAS-TWAS President's Fellowship.



Research and Development

The main research fields are focused on the following: Earth System Model development and its numerical simulation; prediction of meteorological and environmental disasters and the related disasters assessment; data assimilation theory and its applications; and theory of earth system science and natural cybernetics.

Due to its great contribution to the basic and applied research on climate and environmental sciences, ICCES has won many awards and honors, including 1st Natural Science Prize of Chinese Academy of Sciences in 1991, 1998 and 2001; the 2nd National Natural Science Prize of China in 2005; the 1st Prize for the Progress of Science and Technology of Ministry of Education of China in 2008, and CAS distinguished scientific achievement award in 2011. CAS academican, Prof. Qingcun Zeng was elected as the Honorary Member of American Meteorological Society (the world's largest scientific society for the atmospheric and related oceanic and hydrologic sciences) in 2014.

Research Projects

ICCES continues to make tremendous progress in its major research areas. Currently, ICCES scientists chair 37 on-going research projects, including the key national basic research projects funded by the Ministry of Science and Technology of China, as well as other key projects sponsored by the National Natural Science Foundation of China and CAS.





Education and Training

ICCES provides different degree-programmes and training courses for young scientists from China, as well as other countries, including Masters and Ph.D. degrees, post-doctorate programme, and training programmes on climate and environmental sciences. The Center also hosts visiting scholars from all over the world, particularly under various fellowship schemes of CAS and TWAS.

International Collaborations

International cooperation and exchange have been a major emphasis of ICCES. Under the established cooperative connections with international research institutions and universities, ICCES has made a series of promising achievements and trained scores of young people.

ICCES is keen to establish and enhance collaboration with the developing countries through its various programmes. For example, the Thailand-China Cooperative Research Project, titled “Development of Seasonal Climate Forecast System in Thailand Using IAP-DCP Model” and sponsored by Thailand Research Fund (TRF), has been successfully implemented during 2013-2015, this joint project was aimed to promote the application of short-term climate prediction system developed by ICCES in Thailand. Currently, ICCES also serves as the lead centre for COMSATS’ International Thematic Research Group on ‘Climate Change and Environment Protection’.

Capacity-Building Activities

ICCES works closely with TWAS and COMSATS to co-organize international symposia and training workshops to enhance the scientific capacity-building of developing countries in the field of climate and environment sciences.

Since 2000, ICCES hosts the secretariat of CAS-TWAS-WMO Forum, a regular international forum focusing on various important climatic and environmental problems. CTWF serves as a platform for high-level experienced mathematicians,

physicists, atmospheric and oceanic scientists, to exchange ideas, explore scientific problems in depth, and find solutions through joint efforts. The latest CAS-TWAS-WMO Forum was held in July 2015 in Beijing, China, with its theme on 'Coupled Data Assimilation'. More than 180 experts, young scientists and graduated students from both developed and developing countries participated in this forum.

Besides international symposia ICCES also organizes series of training workshops for young scholars from developing countries, and the topics for the workshop are generally beneficial for the sustainable development of the countries. For example, the International Training Workshop on 'Extreme Weather and Climate Events: detection, monitoring, prediction and risk management for developing countries' was held during July 14-23, 2013, in Beijing, China, with the sponsorship of CAS, TWAS and COMSATS, which attracted more than 60 participants from 14 developing countries attending the training workshop.

For further details, please contact:

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International Center for Climate and Environment Sciences (ICCES)

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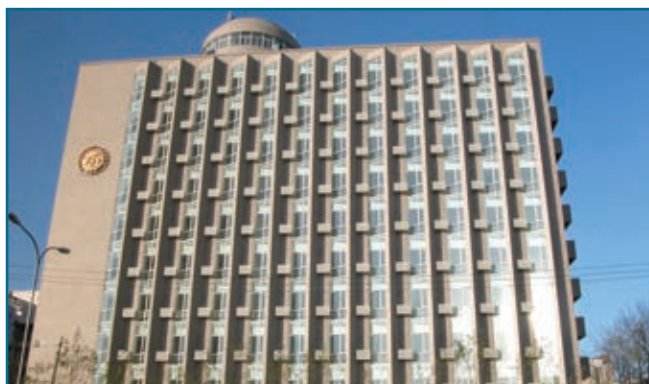
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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. Dr. Zhaohui Lin, Director ICCES, China

Prof. Dr. Zhaohui Lin is an eminent Chinese researcher in the field of environment sciences. Deputed by the Institute of Atmospheric Physics (IAP), Prof. Lin has been the head of International Center for Climate and Environment Sciences (ICCES), Beijing-China, since 2002



Prof. Lin has special research interest and expertise in the areas of seasonal prediction of climate and environmental disasters; development of earth system model; land-hydrology-atmosphere interaction and its role on the climate variability and predictability; dust weather mechanism and prediction; and, dust aerosol-climate interaction. He has successfully implemented numerous research projects sponsored by the Ministry of Science and Technology (MoST), Government of China; Chinese Academy of Sciences; National Natural Science Foundation of China; and other scientific institutions working in the field of climate and environment sciences. At present, he is working on four major projects: (i) CAS Strategic Priority Research Programme: "Uncertainties for the Climate Simulation and Projection, using CAS Climate System Model" (PI, 2011-2015); (ii) International Collaboration Programme, sponsored by MoST: titled "Characteristics and Mechanism of the Extreme Climate Events Under the Climate Change Background" (PI, 2012.5-2014.4); (iii) NSFC Research Programme: Seasonal Hydrological Predictability Using the Dynamical Climate System Model (PI, 2012.1-2015.12); and (iv) NSFC-Yunnan Province Joint Key Research Programme: "Investigation on the Mechanism for the Extreme Drought Events over Yunnan Province" (Co-PI, 2012.1-2015.12).

Since his scientific career in climate science from 1995, Prof. Lin has made many academic achievements. For the seasonal climate prediction, he developed the second generation of dynamical climate prediction system of the Institute of Atmospheric Physics (IAP DCP-II), in 1998. This prediction system has been applied in real-time forecast for summer-rainfall anomalies and spring dust-weather frequency over China, and has been adopted outside China as operational seasonal forecasting system, i.e. in Thailand. Prof. Lin developed a new approach for winter-rainfall prediction based on the East Asian winter monsoon index, and established a new multi-model ensemble prediction method based on Ensemble Kalman filter using different versions of IAP Climate System Models. Furthermore, he revealed the important impact of the land-surface conditions on the potential predictability of summer climate anomaly, and put forward an anomaly-coupling scheme for soil moisture initialization, which is consistent with the forecast system. This significantly increased the ability to make short-term climate prediction.

Prof. Lin has been involved in the climate model development since 1990. He improved the IAP two-level Atmospheric General Circulation Model by introducing new surface albedo parameterization scheme, and further analyzed the climate feedback mechanism for IAP and BMRC climate models in his Ph.D dissertation. Thereafter, he has led a group working on the model development having focus on atmospheric and land-hydrology component of earth system model. His research group established a new roughness length (z_0) parameterization scheme based on city building morphology in order to investigate the impact of urbanization on local and regional weather and climate. The group has also developed a large-scale hydrological model system for water-resource simulation and climate-change impact assessment, and proposed a coupling methodology between groundwater and soil-water; furthermore, developed a coupled land surface and hydrologic model system.

Prof. Lin developed an IAP atmosphere-land-vegetation coupled model, based on OASIS coupler, and evaluated the intensity of land-atmosphere coupling over the global and Asia region by the IAP atmosphere-land coupling model. He firstly proposed the conceptual picture of atmospheric and terrestrial water cycle over Huaihe River Basin, and revealed the inter-decadal variability features of the different hydrological component over the basin. He has also paid much attention to the dust related issues in China and developed an improved numerical dust weather modeling and prediction system in 2005. His research group has coupled several different dust emission schemes with Weather Research and Forecasting (WRF) and Community Earth System Model (CESM), and further revealed the impact of dust emission schemes on the simulation of dust budget and their uncertainties.

The outstanding research achievements of Prof. Lin had won him recognition and awards, such as the Second Grade of State Natural Science Award (2005); First Grade of the Award for the Progress of Science and Technology by the Chinese Ministry of Education (2006); and Governmental Special Allowance offered by the State Council (2008). In 2011, he was awarded the outstanding Science and Technology Achievement Prize of the Chinese Academy of Sciences for his significant achievement on the "Formation and Development Mechanism of Dust Storm and its Monitoring, Forecast and Disaster Assessments". As the Director ICCES, Prof. Lin attaches great value to international cooperation and scientific exchange. He holds membership of COMSATS' Coordinating Council (since 2009), and APEC Climate Center Working Group on Seasonal Prediction (since 2003); contributes as Associate Editor-in-Chief of Climatic and Environmental Research (since 2012), and Associate Editor of Aeolian Research (since 2009), etc. Under his guidance, ICCES has been an active part of international cooperation with renowned international research institutions and universities. Moreover, ICCES also hosts the Secretariat of CAS-TWAS-WMO Forum (CTWF), which is an international forum on climate and environment sciences that meets regularly. As a research scholar, Prof. Lin has published over 80 research papers and co-authored two books. In his capacity as professor, he supervised 25 graduate students at Master and Ph.D levels.

Contact Details:

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Participation in COMSATS' Activities

International Center for Climate and Environment Sciences (ICCES), China

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: ICCES-China has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
1 st Meeting	Prof. Qing-cun Zeng, Executive Director ICCES
2 nd Meeting	Prof. Sixiong Zhao, Executive Director ICCES
3 rd Meeting	Mr. Zheng Xiaoguang, First Secretary (S&T), Embassy of China, Islamabad
4 th Meeting	Prof. Qing-cun Zeng, Professor Emeritus ICCES Prof. Sixiong Zhao, Executive Director ICCES
5 th Meeting	Prof. Sixiong Zhao, Executive Director ICCES
8 th Meeting	Prof. Sixiong Zhao, Executive Director ICCES
9 th Meeting	Prof. Sixiong Zhao, Executive Director ICCES
10 th Meeting	Prof. Sixiong Zhao, Executive Director ICCES
11 th Meeting	Prof. Sixiong Zhao, Executive Director ICCES
13 th Meeting	Prof. Lin Zhaohui, Director ICCES
14 th Meeting	Prof. Lin Zhaohui, Director ICCES
15 th Meeting	Prof. Lin Zhaohui, Director ICCES
16 th Meeting	Prof. Lin Zhaohui, Director ICCES
17 th Meeting	Prof. Lin Zhaohui, Director ICCES Ms. Tong Ting, Secretary of International Affairs, ICCES
18 th Meeting	Prof. Lin Zhaohui, Director ICCES
19 th Meeting	Mr. Zhang Haihua, First Secretary – Science and Technology Section, Chinese Embassy in Islamabad

3. Hosting of COMSATS' Coordinating Council Meetings: ICCES-China hosted 11th meeting of COMSATS Coordinating Council (24th – 26th June 2008) and 4th meeting of COMSATS Coordinating Council (6th – 7th December 1999) in Beijing, China.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 7
5. Organization of COMSATS Activities: ICCES-China has organized following joint activity in collaboration with COMSATS:
 - 13th CTWF Meeting on “Extreme Weather and Climate: Past Present, Future”, September 08-11, 2014, Beijing, China;

- International Training Workshop on ASEAN Science and Technology Park (Development Zone), August 29 to September 16, 2013, Beijing, China;
 - International Training Workshop on “Extreme Weather and Climate Events” and 2nd Meeting of COMSATS’ ITRG on “Climate Change and Environmental Protection”, July 14-23, 2013, Beijing, China;
 - 11th CTWF Workshop on ‘Terrestrial Ecosystems under the Changing Climate’, September 02-05, 2012, Beijing, China;
 - International Seminar on "Methods for Short-term Climate Prediction" 26th March to 7th April, 2012, Nanjing, China;
 - 10th CAS-TWAS-WMO FORUM: International Training Workshop on Regional Climate Change and Its Impact Assessment, September 26-29, 2011, Beijing, China
 - A Foundation Meeting of COMSATS’ Thematic Research Group on Climate Change and Environmental Protection, 20th November 2010, Beijing, China
 - CTWF International Workshop Towards the Development of Regional Earth System Model and its Applications, September 17-19, 2008, Kunming, China
 - 3rd Workshop on "Numerical Weather Prediction", December 6-10, 1999, Beijing, China
6. Research Collaborations with Network Members: During the 17th Coordinating Council Meeting of COMSATS, held in May 2014, ICCES-China, the Iranian Research Organization for Science & Technology (IROST), Iran, and the Soil Conservation and Watershed Management Research Institute (SCWMRI) signed a collaborative MoU for scientific cooperation in the field of Climate and Environmental Sciences. Within the framework of this MoU, three parties will join efforts to undertake joint projects which are related with climate and environmental issues.
7. Participation in COMSATS’ International Thematic Research Groups (ITRGs):
- i) International Centre for Climate and Environment Sciences (ICCES) is Lead Centre of Thematic Research Group on “Climate Change and Environmental Protection”. ICCES is executing a joint research project, entitled “Characteristics and Mechanism of the Extreme Climate Events under the Climate Change Background” under the above mentioned ITRG. The ITRG on ‘Climate Change and Environmental Protection’ has been successful in securing the funding of one million Chinese Yuan from the Chinese Ministry of Science and Technology, with support of COMSATS Headquarters.
- ICCES has organized 4 meetings of COMSATS ITRG and an international training Workshop on “Extreme Weather and Climate Events” (July 14-23, 2013, Beijing) under this ITRG.
- ii) ICCES is also participating in the research project “Mathematical Modeling and Simulation of Air and Water Pollution: Effects and Remedies” being

executed by ITRG on 'Mathematical modeling', being led by National Mathematical Centre (NMC), Nigeria.

8. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of ICCES was published in COMSATS Newsletter Volume 2: Issue No 2 (Mar-Apr 2010) and profile of Director ICCES was published in COMSATS Newsletter Volume 4: Issue No 6 (Nov-Dec 2012).

9. Any other Contribution: Under the COMSATS-ICCES Scholarship Programme, COMSATS and ICCES jointly provided financial support to 2 researchers from Pakistan for PhD and post-doctoral studies in the field of Meteorology.

International Centre for Physics (CIF), Colombia

(Centro Internacional De Física)

Introduction

The International Centre of Physics (CIF) was established in 1985 with the support of Prof. Abdus Salam of the International Centre for Theoretical Physics (ICTP). The Centre is a non-governmental, not-for-profit institution whose objective is to promote the development of physics and related sciences in Colombia and other Latin American countries, by implementing basic and applied research programmes, and supporting high-level activities and technological development for industry. The Centre is playing an active role as one of the members of COMSATS' Network of International Science and Technology Centres of Excellence.



In addition to its scientific and academic services, the Centre has an important role in the policy-making of Colombia for scientific cooperation with its neighbouring countries. Within Colombia, CIF is a pioneer in fields related to Science and Technology legislation, creation of research entities, promotion of science, relationship-building between academia and industry and the creation of high-tech industries.

Scientific Capacity

The substantial experience in a large number of fields that CIF has gained over the years, allows the Centre to offer basic and applied research and advisory services to the production sector in areas such as:

- Electrophysiology;
- Molecular and biochemical biology;
- Plant biotechnology;
- Industrial biotechnology;
- Optical measurement and control methods;
- Environmental control;
- Industrial instrumentation;





- Industrial automation;
- Data transmission and processing;
- Optimization of industrial processes; and
- Security systems.

Additionally, the Centre has the capacity to offer training and upgrading programmes in the above-mentioned fields, both at technical as well as graduate and postgraduate levels.

Training Activities

The Centre is offering a meaningful training programme for researchers, both in Colombia and abroad. Forty-seven young researchers, affiliated with the Centre's research projects funded by the Colombian National Research Foundation (COLCIENCIAS) and foreign governments, have pursued Ph.D. studies in physics, life sciences and engineering at prestigious universities abroad. Forty-five more students are currently engaged in research work at graduate and postgraduate levels. They are involved in activities being carried out by research groups of the Centre. With COLCIENCIAS' financial support, most of these students will be pursuing doctoral studies in Colombia and abroad.

Research and Development

Research work at CIF was started in 1987, which initially focused on biophysics. Since then, 8 groups on basic and applied research and technological development are working in the areas of: Biotechnology; Applied Physics; Technological Development; Chip Design; Nanotechnology; Biophysics and Membrane Biology; Classical Foundations of Physics; and Materials and Optics.

International Collaboration

CIF has focused its activities in Latin America, particularly to the Andean region. Based on the quality of research-work undertaken, the Centre is recognized as Regional Node of the Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre), apart from being a Centre of Excellence of COMSATS.

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Eduardo Posada Flórez, Director CIF, Colombia

Dr. Eduardo Posada Flórez, a Colombian Physicist, is the Executive Director of COMSATS' Centre of Excellence in Colombia, the International Centre for Physics (CIF) and the former Chairperson of COMSATS' Coordinating Council.

Born in Bogotá, Colombia, in 1942, Dr. Posada completed his Bachelors in Physics (1966) from the University of Lausanne (Switzerland) and later, in 1972, received his Ph.D in Physics with honours.



Recognized as one of the fathers of Science, Technology and Innovation Policy in Colombia, Dr. Posada is the co-founder of CIF, where he has promoted several important projects in basic and applied research. Among its achievements to date include the steps taken in the creation of the interactive Museum of Science and Technology (known as Maloka), in Bogota, and the Science and Technology Act (Act 29 of 1990).

Dr. Posada is a Professor Emeritus at the National University of Colombia (1990). At the National University in Bogotá, he has served as the principal investigator of several projects founded by Colciencias (Administrative Department of Science, Technology and Innovation - Colombia), particularly in superconductivity and semiconductor physics. He also promoted several important institutions, like the Research Institute on Corrosion in Bucaramanga, the business incubator - Innovar, and several hi-tec industries. Some of his contributions in physics come from his research work on low temperatures, cryogenics and superconductivity that were undertaken in Colombia and in Europe.

Currently, Dr. Posada is the President of the Colombian Association for the Advancement of Science (ACAC), which is a promoter of the Colombian legislation for science and technology; the scientific fair 'Expociencia'; and the popularization journal 'Innovación y Ciencia'. He is the President of the Board of Directors of Maloka. Other centres for science, research and industry founded/co-founded by Dr. Posada include: Innovate Corporation (Business Incubator); Research Corporation for Corrosion; Liocol Ltd.; Holocol Ltd.; Tec-Laser SA; and Rexco Industries Ltd.

Dr. Posada has also been the Director of the Technical Physics Group (1975-1992) at the Research Laboratory in Coffee Chemistry of the National Federation of Coffee Growers. Besides his current full membership of Colombian Academy of Sciences, Dr. Posada has been the President of the Colombian Society of Physics (1984-

1987); President of the Association for International Physics Center [ACIF] (1982-1987), and President of the Association Interscience (1993-1994).

He has also been an active member of various councils, boards and committees, including:

- International Scientific Council of the International Centre for Theoretical Physics (ICTP) at Trieste (1984-1988);
- Board of the Faculty of Science at the National University of Colombia (1989-1990);
- Committee on Support of Research of the National University of Colombia (1990-1991);
- Board of the National Development and Industrial Quality (1990-1992);
- Board of the Nuclear Affairs Institute (1991-1994);
- Board of the National Bank Foundation (1992-2003);
- Commission on Science, Education and Development (1993-1994);
- Board of Directors of the Corporation Innovation (1994);
- Board of National Basic Science Programme (1992-1994);
- Board of the Research Corporation for Corrosion (1995 - to date).

During the presidential term (1990-1994), the then President Cesar Gaviria made him a member of the Mission of Science, Education and Development, also called Wise Mission in 1993.

Other awards and honours given to Dr. Posada include:

- The National Science Prize 'Alejandro Angel Escobar' (1989);
- Scientific Merit Medal in Gold Category Colombian Science Foundation (2006);
- Researcher Emeritus of the Attorney General's Office (2011);
- Award for Exemplary Colombian (Science) (2013).

As an academician, Dr. Posada has directed more than 30 under-graduate and graduate theses.

Dr. Posada Flórez is married and a loving father of three children.

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Participation in COMSATS' Activities

International Centre for Physics (CIF), Colombia

1. Date of Affiliation to COMSATS: 30th September 1996
2. Participation in COMSATS' Coordinating Council Meetings: CIF-Colombia has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
11 th Meeting	Dr. Eduardo Posada F., Director CIF
13 th Meeting	Dr. Eduardo Posada F., Director CIF
14 th Meeting	Dr. Eduardo Posada F., Director CIF
15 th Meeting	Dr. Eduardo Posada F., Director CIF
16 th Meeting	Dr. Eduardo Posada F., Director CIF
17 th Meeting	Dr. Eduardo Posada F., Director CIF
18 th Meeting	Dr. Eduardo Posada F., Director CIF

Prof. Dr. Eduardo Posada Flórez, Director CIF, was the Chairperson of the COMSATS' Coordinating Council (13th to 18th Meeting of the Council).

3. Hosting of COMSATS' Coordinating Council Meetings: CIF-Colombia hosted 14th Meeting of COMSATS' Coordinating Council held on May 26-27, 2014, in Bogota, Colombia.
4. Research Collaborations with Network Members: During the 17th Coordinating Council Meeting of COMSATS, held in May 2014, CIF-Colombia and the Iranian Research Organization for Science & Technology (IROST), Iran, signed a Memorandum of Understanding for scientific cooperation in the field of space technology and applications. Within the framework of this MoU, both Centres will join efforts to undertake joint projects and develop joint activity in the field of application of space technology.
5. Participation in COMSATS' Publications:
 - i) COMSATS Newsletter: Profile of CIF was published in COMSATS Newsletter Volume 2: Issue No 3 (May-Jun 2010) and profile of Director CIF was published in COMSATS Newsletter Volume 5: Issue No 2 (May-Apr 2013).
 - ii) COMSATS' Journal 'Science Vision': Research article received from CIF-Colombia was published in COMSATS' Journal 'Science Vision', Vol.3, No.1.

National Research Centre (NRC), Egypt

Introduction

The National Research Centre (NRC), Egypt, is the largest multi-disciplinary R&D centre of the country and is devoted to basic and applied research within the major fields of national interest. The Centre was established as an independent public organization in 1956, and is headed by a President with status of a minister and is assisted by two Vice Presidents, one for research and the other for technical affairs. The Minister of Higher Education and Scientific Research is the Higher President of NRC. The Centre is the largest of all institutions affiliated with the Egyptian Ministry of Scientific Research, and employs about 60% of all scientists working in these institutions. Over the years, six divisions of NRC developed into independent research institutes.



Vision & Mission

The Centre has the aim to “foster basic and applied scientific research, particularly in industry, agriculture, public health and other sectors of national economy”. NRC is envisaged to correspond to the country's key production and services sectors through the research conducted in different areas of science and technology, scientific consultation and training. The Centre has the mission to conduct basic and applied research within the major fields of national interest in order to develop and strengthen production and service sectors.

Scientific Potential and Technical Capacity

The Centre is staffed with a sizeable workforce of over 4,800 research personnel, and possesses an impressive infrastructure for scientific and technological research. It consists of 14 research divisions and 110 departments, covering the major areas of industry, health, environment, agriculture, basic sciences and engineering.

Training and Capabilities Development Unit: NRC has a Training and Capabilities Development Unit, which aims to develop scientific and technological capabilities at the national and regional levels in various scientific fields. The Unit also extends its services to external authorities in Egypt, Arab, African, and Commonwealth countries.



Central Unit for Analysis and Scientific Services: The Central Unit for Analysis and Scientific Services of NRC is considered as one of the Special Services Units that is financially, administratively and technically independent. The main purpose of establishing such a unit is providing analytical and functional services to support scientific research within the country, and apply modern technologies to the production and services sectors, as well as raising the efficiency of research in the applied field, and testing the validity of products and their quality.

The Unit also has a prominent role in serving the research plan of NRC by providing scientific services for research projects, within and outside various research departments and divisions of NRC. Through this Unit, M.Sc. and Ph.D. students from various universities and research centres of Egypt are facilitated to carry out measurements and lab tests, in pursuance of their research theses. The unit also comprises two main Labs: Material Testing Laboratory and Central Services Laboratory.



Centres of Excellence: NRC has 5 Centres of Excellence in different disciplines, namely;

- a) Centre of Excellence for Advanced Sciences;
- b) Centre of Excellence for Medical Sciences;
- c) Centre of Excellence for Advances in the Diagnosis Management and Research of Genetics Diseases;
- d) Centre of Excellence for Influenza-A Virus Control: Surveillance, Vaccine Preparation and Drug Discovery; and
- e) Centre of Excellence for Innovative Textile Technology.

Research and Development Council: The R&D Council of NRC manages research plans, and follow-up of research projects, and makes recommendations as to how to benefit from the research results.

Research and Development Programmes

NRC undertakes research activities within three axes: in-house projects, national projects, and international projects.

In-House Research Plans: Under the Tenth Research Plan (2013-2016) of NRC, 398 research projects are being undertaken under 16 research axes including: Health, Renewable Energy; Water; Nanotechnology and Advanced Materials; Biotechnology; Agriculture; Waste Management; Human Genetics; Functional Food; and Carbon Nanotubes.



National Projects: The national-level research projects being undertaken by NRC exceed 200 projects funded by: the Industrial Modernization R&D Programme; the Academy of Scientific Research and Technology; Science and Technology Development Fund; and collaborative work with the private sector.

International Projects: NRC encourages cooperation between its scientists and those from foreign countries – mainly developed countries. In this regard, Egypt-US Partnership Programme: “Science and Technology Transfer”, and Egypt-Germany Partnership Programme are worth-mentioning. Similar programmes are launched with Japan, England, France, Czech Republic, Tunisia, Italy, and Russia. Most of the foreign cooperation takes place in the fields of textile and chemical industries, agriculture, environment, food industry, medical research, biotechnology, and mineral resources.

Currently, the NRC together with the National Research Council of Italy finance equally cooperative programme comprises two-year six research projects in renewable energy, water, food, heritage, as well as biotechnology, nanotechnology, and new materials.

Recently Achieved and Near Future Plans

The NRC has got the ISO 9001 certificate in April 2016.

Network of Central labs: A new 6-storey building was constructed in 2015 at the NRC premises for new/important sectors, such as:

- a) industry-oriented sector;
- b) agriculture and biological sector;
- c) medical sector;
- d) renewable energy sector;
- e) and pharmaceutical sector.

International Cooperation

Aiming to strengthen international collaboration, and through the International Relations Office, African Scientific Relations Bureau, and the European Scientific Relations Bureau, the NRC established an excellent network with similar institutions

all over the world. Among others, research projects, workshops, conferences, training courses are the main forms of the NRC's international cooperation.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. Ashraf H. Shaalan, President NRC, Egypt

Prof. Ashraf H. Shaalan is the incumbent Chairperson of COMSATS' Coordinating Council, comprising the Heads of Centres of Excellence. He was elected as Chairperson in the 19th Meeting of the Council held in Islamabad, Pakistan, in May 2016. Prof. Ashraf H. Shaalan is the President of National Research Centre (NRC), COMSATS' Centre of Excellence in Egypt, which is affiliated to the Egyptian Ministry of Scientific Research, since November 2009.



Prof. Shaalan did his MB.B.Ch. (Bachelor of Medicine, Bachelor of Surgery) in 1983 from the Faculty of Medicine, Ain-Shams University, Egypt. He completed his Ph.D in Childhood Studies from the Institute of Postgraduate Childhood Studies of the same university in 1993.

Previously, Prof. Shaalan was the Vice President of the Academy of Scientific Research and Technology from August 2008 to November 2009. From September 2004 to January 2009, he served as the Head of Medical Research Division of NRC. Prof. Shaalan is a member of the Presidential Council for Education and Scientific Research since August 2014.

As the President of the largest interdisciplinary research institute in the Middle East, Prof. Shaalan has devoted himself to the promotion of interdisciplinary research cooperation among NRC's 110 research departments, covering the major areas of industry, health, environment, agriculture, basic sciences and engineering. Under his leadership, the Centre successfully executed its 9th and 10th research plans (2010–2013 and 2013–2016, respectively). Currently the NRC is pursuing its 11th research plan for the years 2016 to 2019.

The research work carried out by Prof. Shaalan mainly concerns Paediatrics and Anthropology. Having a wide experience in science and technology management, Prof. Shaalan played an active role in preparing Egypt's science, technology, and innovation policy; and building partnerships among analogous academia, government and industry.

At international fora, Prof. Shaalan succeeded to enhance research collaboration with many countries such as Italy, Germany, France, USA, China, India, Russia, and Japan through joint research projects. He fortified the collaboration with many international organizations; namely DAAD, JICA, British Council, CIDA, SIDA and IDB. Prof. Shaalan has been a proponent of regional collaboration in science and

technology. He has actively contributed as Member of the National Flour Fortification Alliance, selected by the United Nations World Food Programme (2007); and Co-founder of Middle East and North Africa Nutrition Association – MENANA (2004). He is founder, co-founder and member of many scientific societies in Egypt and abroad. He is also the head of Egyptian National Nutrition Committee and has served many other scientific committees as member.

In recognition of his scientific excellence, Prof. Shaalan has won the following national awards:

- Award of Recognition from Cairo Medical Syndicate for the Scientific Excellence;
- Award of Recognition from Giza Medical Syndicate for the distinguished role of the applicant in medical services and for the promotion of the health status in Giza Governorate, Egypt;
- Award of Recognition from the High Institute of Childhood Postgraduate Studies, and the Center of Childhood Studies, Ain-Shams University, Egypt;
- Certificate of Appreciation and the Medallion of the Council of Arab Economic Unity of Arab Federation for Sustainable Development and the Environment;
- Medallion of the Association of Egyptian Scientists in America and Canada;
- Medallion of honor from the National University in Kingdom of Bahrain; and
- Medallion of Moulay Ismail University, Meknes, Kingdom of Morocco.

As an academic, Prof. Shaalan has published more than 40 articles in local and international scientific journals. The theme of majority of these studies is child growth and development, child nutrition and assessment of nutritional status. He is also the Editor of the Egyptian Medical Journal of NRC (MJNRC) and member of scientific board of many other scientific journals.

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Participation in COMSATS' Activities

National Research Centre (NRC), Egypt

1. Date of Affiliation to COMSATS: 28th April 1997
2. Participation in COMSATS' Coordinating Council Meetings: NRC-Egypt has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
2 nd Meeting	Dr. Ahmad Fakhry, Vice President NRC
5 th Meeting	Prof. Hamam El Abd, Professor of Chemical Engineering, NRC
7 th Meeting	Prof. Dr. Osama El-Shabrawy, Vice President NRC
8 th Meeting	Prof. Dr. Osama El-Shabrawy, Vice President NRC
9 th Meeting	Prof. Dr. Osama El-Shabrawy, Vice President NRC
10 th Meeting	Prof. Dr. Esmat A. Ghaffar, Vice President NRC
11 th Meeting	Prof. Dr. Osama El-Shabrawy, Emerituis Professor NRC
12 th Meeting	Prof. Dr. Osama El-Shabrawy, Ex-Vice President NRC
13 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC
14 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC
15 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC
16 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC
	Prof. Hosam El-Sayed, Assistant Vice President for Research, NRC
18 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC
	Prof. Hosam El-Sayed, Assistant Vice President for Research, NRC
19 th Meeting	Prof. Dr. Ashraf Shaalan, President NRC, Egypt
	Prof. Hosam El-Sayed, Assistant Vice President for Research, NRC

3. Hosting of COMSATS' Coordinating Council Meetings: NRC-Egypt hosted 10th Meeting of COMSATS Coordinating Council (June 18-19, 2007, Cairo, Egypt) and 8th Meeting of COMSATS Coordinating Council (March 14-15, 2005) in Cairo, Egypt.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 20
5. Organization of COMSATS Activities: NRC-Egypt has organized following joint activities in collaboration with COMSATS:

- Foundation Meeting of COMSATS' ITRG on 'Agriculture, Food Security and Biotechnology' (June-10, 2015) & International Conference on Agriculture, Food Security and Biotechnology (June 8-9, 2015), in Cairo, Egypt;
 - International Conference on Nanomaterials and Nano-devices, December 8-9, 2014, Cairo, Egypt;
 - 11th International Conference on Chemistry and Its Role in Development, March 11-15, 2013, Cairo, Egypt;
 - National Training Workshop on Repair and Maintenance of Scientific Engineering Equipment in Universities, Research Institutions, and Small Scale Industries, November 13-17, 2011, Cairo, Egypt;
 - International Seminar on North-South Dialogue on Migration and Development, December 29-31, 2007, Cairo, Egypt;
 - Human Stem Cell: Principals and Applications Application, December 24-31, 2007, Cairo, Egypt;
 - International Conference on Biotechnology, December 2006, Cairo, Egypt;
 - International Workshop on Agro-food processing, December 3-7, 2005, Cairo Egypt; and
 - International Workshop on Plant Biotechnology, December 3-7, 2005, Cairo, Egypt.
6. Research Collaborations with Network Members: To establish the collaboration between NRC-Egypt and Industrial Research Consultancy Centre (IRCC), Sudan, the Director General IRCC visited the National Research Centre, Egypt, on June 22-27, 2013.
7. Participation in COMSATS' International Thematic Research Groups (ITRGs):
- i) National Research Centre (NRC) is Lead Centre of International Thematic Research Group on "Agriculture, Food Security, and Biotechnology". NRC-Egypt is executing a joint research project entitled "Biotechnological Approaches to Improve some Wheat Lines Productivity under Biotic and Abiotic Stresses" under the above mentioned ITRG. The Foundation Meeting of COMSATS' ITRG on Agriculture, Food Security, and Biotechnology ' was jointly organized by COMSATS and the Lead Centre, the National Research Centre (NRC), Egypt, on 10th June 2015, in Cairo, Egypt, on the sidelines of NRC-COMSATS International Conference on 'Agriculture, Food Security, and Biotechnology' (June 8-9, 2015, Cairo, Egypt).
 - ii) NRC is also member of the following COMSATS' International Thematic Research Groups:
 - "Drug Discovery from Nature for Neglected Diseases" being executed by ITRG on "Natural Products Sciences", and led by International Center for Chemical and Biological Sciences (ICCBS), Pakistan; and
 - "Enabling ICT Applications using Long Distance Wi-Fi Networks" being executed by ITRG on 'Information and Communication Technologies'

and led by COMSATS Institute of Information Technology (CIIT), Islamabad.

8. Participation in COMSATS' Publications:

- i) COMSATS Newsletter: Profile of NRC-Egypt was published in COMSATS Newsletter Volume 3: Issue No 1 (Jan-Feb 2011) and profile of President of NRC was published in COMSATS Newsletter Volume 5: Issue No 1 (Jan-Feb 2013).
- ii) COMSATS' Journal 'Science Vision': Research articles received from NRC-Egypt have been published in COMSATS' Journal 'Science Vision', Vol.12, No.1-4, and Vol.13 and Vol.14.

Council for Scientific and Industrial Research (CSIR), Ghana

Introduction

The Council for Scientific and Industrial Research (CSIR) of Ghana was established by NLC Decree 293 (October 10, 1968) amended by NLC Decree 329 (1969), and re-established in its present form by CSIR Act 521 on November 26, 1996. The genesis of the Council, however, dates back to the erstwhile National Research Council (NRC), which was established by the government in August 1958 to organize and coordinate scientific research in Ghana. In 1963, the NRC merged with the former Ghana Academy of Sciences. Following a review in 1966, the Academy was reconstituted into, essentially, its original component bodies, namely a national research organization re-designated the CSIR and a learned society, designated the Ghana Academy of Arts and Sciences.



The distinctive features of the 1996 Act are the emphasis on private-sector concerns, and the introduction of market principles into the Council's operations through the commercialization of research. In this connection, the Council is expected to generate part of its income through the sale of its products and services and to institute a system of contract research.

Functions of the Council

CSIR is mandated to perform the following functions among others:

- To pursue the implementation of government policies on scientific research and development;
- To advise the relevant Minister on scientific and technological advances likely to be of importance to national development;
- To encourage coordinated employment of scientific research for the management, utilization and conservation of the natural resources of Ghana;
- To encourage in the national interest scientific and industrial research of importance for development of agriculture, health, medicine, environment, technology and other service sectors, and to this end to encourage close linkages with the production sectors of the economy;
- To coordinate all aspects of scientific research in the country and to ensure that



the Council, the research institutes of the Council, and other organizations engage in research in Ghana, coordinate and cooperate in their research efforts;

- To exercise control over the research institutes and projects of the Council and to have power after consultation with the Minister to create, reconstitute, merge or dissolve any institute, centre, unit or project of the Council;
- To review, monitor and periodically evaluate the work of the institutes administered by the Council in order to ensure that research being carried out by the institute directly benefits identified sectors of the economy and is within the national priorities;
- To institute a system of contract research to ensure that research being carried out in the Council is relevant and cost-effective;
- To encourage and promote the commercialization of research results;
- To undertake or collaborate in the collation, publication and dissemination of the results of research and other useful technical information;
- To organize and control services and facilities available to the Council and generally to manage the properties of the Council;
- To coordinate human resource development in institutes of the Council and to encourage the training of scientific personnel and research-workers through the provision of grants and fellowships;
- To cooperate and liaise with international and local bodies and organizations, in particular, the universities and the private sector on matters of research; and
- To perform such other functions as may be determined by the Minister for Environment, Science, Technology and Innovation.



Vision

The CSIR has the vision to use the transforming power of S&T for wealth creation.

Mission

The mission of the CSIR is to become the force for accelerated social and economic development of Ghana through examining, exploring and creating S&T catalysts for public and private wealth creation.

Institutions under the Council

Currently, the Council exercises control over thirteen (13) research institutes, which are stationed nationwide, namely:

- Animal Research Institute (ARI), Accra;
- Building and Road Research Institute (BRI), Kumasi;
- Crops Research Institute (CRI), Kumasi;



- Forestry Research Institute of Ghana (FORIG), Kumasi;
- Food Research Institute (FRI), Accra;
- Institute of Industrial Research (IIR), Accra;
- Institute for Science and Technological Information (INSTI), Accra;
- Oil Palm Research Institute (OPRI), Kusi-Kade;
- Plant Genetic Resources Research Institute (PGRRI), Bunso;
- Savanna Agricultural Research Institute (SARI), Tamale;
- Science and Technology Policy Research Institute (STEPRI), Accra;
- Soil Research Institute (SRI), Kumasi; and
- Water Research Institute (WRI), Accra.

CSIR - Animal Research Institute: The Animal Research Institute (ARI) is the leading institution that develops and transfers technologies related to livestock and poultry production in Ghana. The overall contribution of CSIR-ARI to the national economy is to stimulate, through R&D, accelerated production and consumption of animal protein. As part of its mandate CSIR has also been involved in studying extension access and adoption of improved technologies transferred to its clients in Ghana.

CSIR - Building and Road Research Institute: The Building and Road Research Institute (BRRI) has the mandate to undertake research into all aspects of building and road planning, designs, construction and maintenance with a view to assisting the construction industry to be more efficient, safe and economical, and to develop local construction materials for increased utilization in construction.

CSIR - Crops Research Institute: The Crops Research Institute (CRI) has the mandate to research and develop improved varieties of food and industrial crops and their production technologies to enhance food security and poverty reduction.





CSIR - Forestry Research Institute of Ghana: Forestry Research Institute of Ghana (FORIG) has the mandate to undertake research related to forestry and forest products to ensure sustainable management and utilization of Ghana's forest resources.

CSIR - Food Research Institute: The Food Research Institute (FRI) was established in 1965 by the Government of Ghana to conduct market-oriented applied research, provide technical services and products to the food industry; assist in poverty alleviation through the creation of opportunities for income generation; and contribute to food security and foreign exchange earnings. CSIR-FRI's aspiration is to be the leading Science and Technology Institute in the transformation of the food processing industry in Ghana.

CSIR - Institute of Industrial Research: The Institute of Industrial Research (IIR), which is Ghana's foremost industrial research and development organization emerged out of the merger of the former Industrial Research Institute (IRI) and Scientific Instrumentation Centre (SIC) in 1998.

CSIR - Institute for Scientific and Technological Information: The Institute for Scientific and Technological Information (INSTI) is the leading integrated scientific and technological information (STI) institute in Ghana that provides the major public research and academic institutions, as well as the industry member with resources and services designed to improve dissemination of and access to indigenous and international STI. The Institute serves as the main information hub for the CSIR.

CSIR - Oil Palm Research Institute: The Oil Palm Research Institute (OPRI) was set up in 1964 to take over functions of the West Africa Institute for Oil Palm Research (WAIFOR) after WAIFOR's dissolution. WAIFOR then was responsible for provision of oil palm planting materials and research support to the Anglophone countries.

The OPRI was established as a division of the Crop Research Institute (CRI). It gained autonomy from the CRI in 1979 and became a full-fledged Institute in 1988. In 1992, the OPRI was additionally mandated to carry out research into coconut, in general, and the Cape Saint Paul Wilt Disease (CSPWD), in particular.

CSIR - Plant Genetic Resources Research Institute: The Plant Genetic Resources Research Institute (PGRRI) has the mandate to collect and conserve

Plants Genetics Resources (PGR) of Ghana, as well as to coordinate PGR activities in the country.

CSIR - Savanna Agriculture Research Institute: The Savanna Agriculture Research Institute (SARI) was originally known as the Nyankpala Agricultural Experiment Station (NAES). In June 1994, it was upgraded to a full-fledged institute and re-named as Savanna Agriculture Research Institute.

CSIR - Soil Research Institute: The Soil Research Institute (SRI) has the mandate to undertake inventory of the soil resources of Ghana and carry out scientific research to generate information and technology for effective planning, utilisation and management of the soil resources of Ghana for increased and sustainable agriculture, industry, as well as ensuring safe and sound environment.

CSIR - Science and Technology Policy Research Institute: The Science and Technology Policy Research Institute (STEPRI) has the mandate to provide research support for national Science and Technology policy development.

CSIR - Water Research Institute: The Water Research Institute (WRI) is a public institution established in 1996 by the CSIR Act 521. It was created by the merger of the Water Resources Research Institute (WRRRI) and the Institute of Aquatic Biology (IAB) of CSIR, which were created in 1965 and 1982, respectively.

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Victor Kwame Agyeman, Director General, CSIR, Ghana

Dr. Victor Kwame Agyeman is the current Director-General and a Chief Research Scientist of the Council for Scientific and Industrial Research (CSIR), since January 2015. He is regarded as one of the leading authorities on Tropical Forest Ecology in Africa.



Dr. Agyeman holds a B.Sc (Hons) in Natural Resources Management (1985) from Kwame Nkrumah University of Science and Technology (KNUST), Ghana. Subsequently, he undertook his M.Phil research work at KNUST under a 'Sigma (σ) Research Grant for Young Scientists'. In 1990, he did his Ph.D from the University of Aberdeen, Scotland, U.K. He continued pursuing higher education obtaining his LLB (Law degree) from KNUST, and a Qualifying Certificate/Barrister-at-Law (QC/BL) from the Ghana School of Law in 2012.

In 1985, Dr. Agyeman joined CSIR's Forestry Research Institute (CSIR-FORIG), and in 1990 he was promoted to Senior Research Scientist at the Institute. He was appointed the Head of the Natural Forest Management Division (NFMD) in 1996. Between 2000 and 2001, Dr. Agyeman served as Management Consultant on a World Bank supported sector wide Natural Resources Management Programme (NRMP), which was executed by the then Ministry of Lands, Forestry and Mines (MLFM). Upon his return to CSIR-FORIG in January 2004, he was promoted to the rank of Principal Research Scientist (PRS). In 2007, he was appointed the Director of CSIR-FORIG. Having relevant qualification and expertise, Dr. Agyeman has also rendered his services as a Solicitor and Barrister of the Supreme Court of Ghana.

Dr. Agyeman also served as the Project Management Consultant to the African Development Bank (AfDB)-funded Community Forestry Management Project (CFMP) worth US\$10 million, for two years (between 2002 and 2004). From 2010 to 2012, he was also part of a three (3) member Ghanaian expert team appointed by Ministry of Lands and Natural Resources (MNLG-Ghana) to develop a US\$86 million Forest Investment Project (FIP).

Dr. Agyeman was the lead consultant for a Sector Strategic Analysis of the Forestry Sector of Liberia in 2010. He was also a Member of a Panel of Experts contracted by the International Tropical Timber Organization (ITTO) to develop 'Criteria and Indicators (C&I) for Sustainable Forest Management'. In addition, Dr. Agyeman has served as a member of six different 'Panels of Experts' under the auspices of the United Nations Forum on Forests (UNFF), New York, in 2006, and the ITTO in 1996,

2000, 2003, 2005, and 2010. He supported Food and Agriculture Organisation (FAO) in 2004 to develop an African Position Paper, which was presented by Ministers of State for Forestry and Heads of Forestry Organisations in Africa at the 17th session of the Committee on Forestry (COFO) at FAO, Rome, in March 2005. The output of the consultancy also served as a working document for the African Position during negotiations at the Fifth United Nations Forum on Forests, in New York in 2005.

Dr. Agyeman has represented Ghana at several high-level international meetings. He was a member of a team of experts that represented Ghana at the United Nations (UN) for the negotiations for an International Arrangement on Forests (IAF) in 2007. Dr. Agyeman has also been the recipient of a Rockefeller Foundation Fellowship/Grant to give two lectures at Tufts University in Boston, USA, on "Sustainable Forest Management in Ghana". Between 1994 and 2013, Dr. Agyeman participated in over 70 international conferences and undertook study visits to 30 different countries, in Africa, Asia, Europe, Latin America, USA and Australia.

Dr. Agyeman has been the chairperson of the Forestry Research Network of Sub-Saharan Africa (FORNESSA) from 2009 to date. He was also a Founding Member of the Ghana Institute of Foresters (GIF). He is also currently a Member of the Ghana Bar Association (GBA). Dr. Agyeman is a Board Member or Member of the Board of Trustees of a number of international organizations and fora, including:

- Member, Technical Panel on Forest Quarantine (TPFQ) of the International Plant Protection Convention (IPPC), Rome, Italy;
- Member, Board of Trustees, Lake Victoria Research Initiative (VicRes), Kampala, Uganda;
- Member, Governing Council of the African Forest Forum (AFF), Nairobi, Kenya;
- Member, Board of Trustees of the Plant Resources of Tropical Africa (PROTA), Wageningen, Netherlands;
- Member, National Biodiversity Committee (NBC), under the Ministry of Environment, Science, Technology and Innovation (MESTI), Ghana.

He has authored one hundred and twenty-eight (128) edited Journal publications, books, monographs and research reports.

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Prof. Dr. Victor Agyeman (Esq.)

Director-General

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Participation in COMSATS' Activities

Council for Scientific and Industrial Research (CSIR), Ghana

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: CSIR-Ghana has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
1 st Meeting	Dr. K. Sraku Lartey, Director ICMST
2 nd Meeting	Dr. John Ocloo, Representative BRRI
3 rd Meeting	Dr. K. Sraku Lartey, Director NIMME
4 th Meeting	Prof. Jonas K. Boadi, Director NIMME
8 th Meeting	Prof. Jonas K. Boadi, Coordinator ICMST
9 th Meeting	Mr. Seth Owusu Nyako, Representative ICMST
12 th Meeting	Mr. Eugene Atiemo, Director BRRI
13 th Meeting	Mr. Eugene Atiemo, Director BRRI
15 th Meeting	Dr. Abdulai Baba Salifu, Director-General CSIR
16 th Meeting	Dr. Abdulai Baba Salifu, Director-General CSIR
	Mr. Eugene Atiemo, Director BRRI
18 th Meeting	Mr. Eugene Atiemo, Director BRRI
19 th Meeting	Prof. Dr. Victor Agyeman, Director-General CSIR, Ghana

During the 15th COMSATS Coordinating Council Meeting, the Council unanimously approved re-designation of Council for Scientific and Industrial Research (CSIR), Ghana, as a member of COMSATS' Network of International Science and Technology Centres of Excellence, in place of its constituent organization, Building and Road Research Institute (BRRI).

3. Hosting of COMSATS' Coordinating Council Meetings: CSIR-Ghana hosted 16th Meeting of COMSATS' Coordinating Council, held on May 2-3, 2013, in Accra, Ghana.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 2
5. Organization of COMSATS Activities: CSIR-Ghana has organized following joint activities in collaboration with COMSATS:
 - Workshop on Repair and Maintenance of Scientific Engineering Equipment, October 12-16, 2015, Accra, Ghana; and
 - National Training Workshop on Repair and Maintenance of Scientific

Engineering Equipment in Universities, Research Institutions and Small Scale Industries, August 25-29, 2013, Accra, Ghana

6. Research Collaborations with Network Members: Dr. Fahim A. Qureshi, General Manager (Research Development)/Associate Professor, Office of Research, Innovation and Commercialization, COMSATS Institute of Information Technology (CIIT), Pakistan, visited CSIR-Ghana to participate in “Commercialization Fair for Research Scientists”, held on October 28 – 30, 2015, in Accra, Ghana.
7. Participation in COMSATS’ International Thematic Research Groups (ITRGs): International Centre for Material Science & Technology (ICMST), Ghana, is Lead Centre of International Thematic Research Group on “Construction Materials”.
8. Participation in COMSATS’ Publications:
 - i) COMSATS Newsletter: Profile of International Centre for Material Science and Technology (ICMST), Ghana, was published in COMSATS Newsletter Volume 3: Issue No 3 (May-Jun 2011) and profile of Director-General of CSIR was published in COMSATS Newsletter Volume 5: Issue No 3 (May-Jun 2013).
 - ii) COMSATS’ Journal ‘Science Vision’: 5 Research papers and articles received from CSIR-Ghana have been published in COMSATS’ Journal “Science Vision” Vol.3, No.4; Vol.4, No.1; Vol.6, No.1; Vol.9, No.1-4; and Vol.12, No.1-4.
9. Any other Contribution:
 - i) Hosting of General Meeting of COMSATS: The 3rd General Meeting of COMSATS was convened by the President of Ghana, H.E. John Dramani Mahama, in Accra, on 27-28 October 2015. The Ministry of Environment, Science, Technology and Innovation (MESTI), Government of Ghana, in collaboration with CSIR-Ghana, graciously hosted the General Meeting.
 - ii) Hosting of COMSATS Consultative Committee Meetings: The 3rd Consultative Committee Meeting of COMSATS was held in conjunction with the 3rd General Meeting of the Commission, on 26th October 2015, in Accra, Ghana.
 - iii) The 2nd meeting of COMSATS Consultative Committee was held on 1st May 2013, in Accra-Ghana, in conjunction with the 16th meeting of COMSATS Coordinating Council, and was jointly hosted by the Ministry of Environment, Science, Technology and Innovation, Government of Ghana, and COMSATS’ Centre of Excellence in Ghana, the Council for Scientific and Industrial Research (CSIR).

Iranian Research Organization for Science and Technology (IROST), Iran

Introduction

The Iranian Research Organization for Science and Technology (IROST) was founded in 1980 in Islamic Republic of Iran shortly after the ratification of the IROST's Statute by the Council of Islamic Revolution, with the aim of providing support to Iranian researchers, inventors and industrialists across the country. And later in 1991, the Iranian Council for Higher Education Development approved amendments to the IROST's Statute. IROST as one of the leading Iranian organizations for science and technology (S&T) that mainly aims to devote itself to achieving independence in scientific and technological pursuit of the country by supporting and exploiting the potential offered by the Iranian inventors, innovators, researchers and industrialists and responding to the increasing demands for S&T development programmes. This organization provides valuable services in fulfilling the country's scientific, technical and engineering requirements by supporting applied and developmental research, as well as developing new technologies by making use of qualified experts and modern equipment and facilities.



Missions and Objectives

IROST's major objectives are to:

- provide support for the development of high priority technologies at national level, and offer consultations for evaluation, commercialization and marketing of these technologies at home and abroad;
- provide the grounds for effective utilization of research results by leading research to production;
- encourage and expand research activities in the area of modern technologies;
- carry out strategic studies and research , and analyze vulnerabilities to the national technology development system;
- evaluate patent applications, scientifically and professionally, and issue approval certificates for the grant of patents in the country;



- hold research-oriented Ph.D (Doctoral) Programmes, and organize short-term educational workshops and courses;
- introduce and present technologies developed by the researchers through the organization of technology markets and exhibitions;
- execute major projects with the aim of technology development at national level;
- organize and coordinate Intellectual Property (IP) protection efforts in the country;
- encourage and facilitate entrepreneurship within Iranian universities through the activities of IROST's Entrepreneurship Secretariat;
- recognize the talents and contributions of researchers and innovators by holding Khwarizmi Youth and Khwarizmi International Awards, as well as other scientific events;
- Manage the National Scientific Data Center.



IROST Institutions

- i. Institute of Advanced Materials and Renewable Energies;
- ii. Agricultural Research Institute;
- iii. Institute of Biotechnology;
- iv. Institute of Chemical Technology;
- v. Institute of Electrical Engineering and Information Technology;
- vi. Institute of Mechanical Engineering; and
- vii. Research Institute for New Technology Development Studies (RINTDS).

Institute of Advanced Materials and Renewable Energies: The Institute was established in 2006 in view of the vast investment made by Iran in the field of materials and metallurgy and its emphasis on the development for metallurgy technology under the 4th five-year development plan of the country.

The Institute's academic staff comprising engineers, technicians, and Ph.D./M.Sc. students contribute towards the following research areas:

- Advanced and Nano materials;
- Corrosion and Surface Engineering; and
- Renewable Energy.

Agricultural Research Institute (ARI): The Institute was established in 1980, and is the only agricultural institute of the Iranian Ministry of Science, Research and Technology that undertakes research in the field of practical and applied agricultural science. This Institute conducts research in the fields of medicinal plants, post-harvest technology, animal science and poultry, agricultural engineering, plant production, organic agriculture, applied entomology and integrated pest

management. The results of the three decades of research activity have helped develop agricultural technologies that are ready for commercialization and to contribute to food security, sustainable agriculture and increase productivity.

The Institute has four departments:

- Animal, Poultry & Aquatic Sciences;
- Biosystems Engineering;
- Medicinal Plants; and
- Plant Production and Sustainable Agriculture.

Institute of Biotechnology: The Institute of Biotechnology was developed in 1980. It is recognized as Central and East Asia's focal point in the field of biotechnology, and was appointed as a member of International Biotechnology Networks.

Some of the activities undertaken by the Institute are:

- Study of microflora of oil-pollutant areas of Norooz, Aboozar, and Soroosh in Persian Gulf;
- Semi-commercial production of lactic acid, probiotics and starter cultures;
- Application of biotechnological methods in oil industries, including biosurfactants (emulsifiers) and biological solutions;
- Green biofuel production;
- Enzyme production for application in clinical diagnosis kits;
- Recombinant protein production; and
- Bioethanol production from lignocellulotic materials.



Institute of Chemical Technology: The Institute of Chemical Technology was established in 1984. It has been training Ph.D. and M.Sc. students for research in areas of applied chemistry, organic chemistry, inorganic chemistry, analytical chemistry, nanochemistry, chemical engineering, and food science and technology.

The Institute focus its research on synthetic pharmaceuticals; natural products and medicinal plants processing; natural gas and petrochemicals; nanotechnology; minerals; design, modeling, simulation and reaction engineering of chemical processes; food technology; environmental technologies; thin layer and solar cells; and fuel cell and hydrogen.

The Institute has lab facilities for conducting thin-layer chromatography; spectroscopy and instrumental analysis; standardization of medicinal plants and phytomedicines; and fuel cell and catalysis. It also has faculties for Food Science & Technology; Advanced Separation Technologies; Environmental Technology; and Nanotechnology.

Institute of Electrical Engineering and Information Technology: The Institute has the following major divisions:

- Communication & Space Technologies;
- Medical Engineering;
- Energy and Industrial Automation; and
- Information Technology and Intelligent Systems.

The Institute aims at R&D leading to innovative technologies. In maximizing this goal, the Institute pursues the following objectives:

- to identify novel and prioritized technologies, and continue further development and upgrade work after determining their industrial applications;
- to create direct links with the industrial sector in order to alleviate their existent problems and promote novel solutions and technologies which can benefit the industries;
- to execute applied research projects in order to obtain the technical know-how and initiate successive pilot programmes and under royalty offering the know-how to private sectors;
- to train and hire skilled manpower in order to advance the scientific outlook of the institute;
- to develop and upgrade lab facilities and technological sites with the aim of transforming them into specialized national reference laboratories, to meet the needs of the industry; and
- to support and provide scientific advice to researchers, inventors, innovators, and new technology-based companies by evaluating and certifying their ideas and products (i.e., type approval, patent registration, development centers and festivals).



Institute of Mechanical Engineering: This Institute was established in 1980, and since then it has played a major role in providing support to Iranian researchers, innovators and inventors, both at national and international levels, and carrying out applied research for supporting and supplementing the research activities in the industry. The main objectives of Mechanical Engineering Institute can be summarized as:

- development of advanced technologies for energy production, and its optimum utilization for increased productivity;
- designing and establishing accredited standard laboratories in related fields;
- conducting applied and basis research in the field of aerodynamics for use in industrial applications;
- research on the mechanical aspects in the field of aerospace, with emphasis on the design, construction and application of mechanical subsystems and mechanisms for satellite applications; and

- applied mechanical design and mechatronics.

The Institute performs its functions through the following departments:

- Aerospace Engineering;
- Energy Productivity and Utilization; and
- Machine Design and Mechatronics

The current active laboratories of the Institute are:

- Internal Combustion Engine laboratory;
- Fuel and Combustion laboratory;
- Ultrasonic Wind Tunnel laboratory;
- Hydraulic and Pneumatic laboratory;
- Vibration laboratory;
- Pump and Turbine laboratory;
- Fan Testing laboratory;
- Lab of Mechanics of Materials, and
- Prototyping laboratory.

Research Institute for New Technology Development Studies (RINTDS): This Institute was established at IROST in 1992 for research on various areas of technology management. The main activity of the Institute is to conduct research projects on S&T policies, with programmes leading to promotion of technological capabilities and S&T development related to socio-economic progress of the country for sustainable development.

The Institute's strategy and long-term planning is to support the country in making sound transition from oil-driven economy to a knowledge-based economy. Further, the activities of the Institute are formulated in such a way that its programmes contribute towards supporting the major programs of the Iranian Ministry of Science, Research and Technology at large.

Some of the main functions of RINTDS are:

- comparative study of science and technology policies in different countries in order to obtain the common characteristics, as well as to identify differences to determine the best practice for improving technology policy in the country;
- studying the main obstacles, success and failure factors in development of technology in the country;
- comparative study of technological needs, local technological capabilities and the capacity of technology transfer at the national level;
- comparative study of science and technology institutes in different countries and their role in development of technology, the procedure of technology policy-making, and planning and managing of science and technology;
- assessment of R&D activities and technological innovations at the national level; and
- studying of entrepreneurship development, activities and evaluation of their

capacity and providing training to them.

International Linkages

IROST is official focal point of the following international organizations:

- Asian and Pacific Centre for Transfer of Technology (APCTT);
- Commission on Science and Technology for Sustainable Development in the South (COMSATS);
- Organization of Islamic Cooperation Standing Committee on Scientific & Technological Cooperation (COMSTECH);
- IORA Regional Centre for Science and Technology Transfer (IORARCSTT);
- Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre); and
- World Association of Industrial & Technological Research Organizations (WAITRO).

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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 Universität 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, Preussag 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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Participation in COMSATS' Activities

Iranian Research Organization for Science and Technology (IROST), Iran

1. Date of Affiliation to COMSATS: 15th March 2004
2. Participation in COMSATS' Coordinating Council Meetings: IROST-Iran has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of IROST Delegates
11 th Meeting	Dr. Gh. H. Rahimi, Deputy Minister & President IROST
12 th Meeting	Dr. A. G. Allahyari, Director of Entrepreneurship
13 th Meeting	Prof. Mohammad H. Entezari, Deputy of Scientific & Int. Cooperation
	Dr. M. Molanejad, Acting President for International Cooperation
15 th Meeting	Dr. Ahmad Akbari, President
16 th Meeting	Dr. Ahmad Akbari, President
	Dr. M. Molanejad, Acting President for International Cooperation
17 th Meeting	Dr. Ahmad Akbari, President
	Dr. M. Molanejad, Acting President for International Cooperation
18 th Meeting	Dr. M. Molanejad, Acting President for International Cooperation

3. Hosting of COMSATS' Coordinating Council Meetings: IROST-Iran hosted 17th Meeting of COMSATS' Coordinating Council, held on May 19-20, 2014, in Tehran, Iran.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 14
5. Organization of COMSATS Activities: IROST has organized following joint activities in collaboration with COMSATS:
 - National Workshop on 'Repair and Maintenance of Scientific Engineering Equipments in Universities, Research Institutions and Small Scale Industries', in Karaj, Iran, from September 28 to October 02, 2014;
 - International Workshop & Exhibition on 'Sustainable Utilization of Natural Products for Human Health and Well Being', held in Tehran, Iran, on January 20-22, 2014; and
 - COMSATS has been a regular sponsor of the Khwarizmi International Award (KIA), hosted by IROST-Iran, and contributed first (US \$ 1,000) and second cash prizes (US \$ 500) for the 13th, and 15th-28th Khwarizmi

International Awards, Iran.

6. Research Collaborations with Network Members: During the 17th Coordinating Council Meeting of COMSATS, held in May 2014, IROST-Iran establish the research collaboration with the following Network Members:

- i) IROST-Iran and International Centre for Physics (CIF), Colombia, signed a Memorandum of Understanding for scientific cooperation in the field of space technology and applications. Within the framework of this MoU, both Centres will join efforts to undertake joint projects and develop joint activity in the field of application of space technology;
- ii) IROST-Iran, International Centre for Climate and Environmental Sciences (ICCES) and the Soil Conservation and Watershed Management Research Institute (SCWMRI) signed a Memorandum of Understanding for scientific cooperation in the field of Climate and environmental sciences. Within the framework of this MoU, three parties will join efforts to undertake joint projects which are related with climate and environmental issues.

7. Participation in COMSATS' International Thematic Research Groups (ITRGs):

- i) IROST-Iran is Lead Centre of Thematic Research Group on "Renewable Energy".
- ii) IROST is also participating in the following research project of ITRGs:
 - "Characteristics and Mechanism of the Extreme Climate Events under the Climate Change Background" being executed by the ITRG on 'Climate Change and Environmental Protection', and led by International Center for Climate and Environment Sciences (ICCES), China; and
 - "Enabling ICT Applications using Long Distance Wi-Fi Networks" being executed by ITRG on 'Information and Communication Technologies' and led by COMSATS Institute of Information Technology (CIIT), Pakistan.

8. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of IROST was published in COMSATS Newsletter Volume 1: Issue No 5 (Sept-Oct 2009) and profile of President IROST was published in COMSATS Newsletter Volume 8: Issue No 1 (Jan-Feb 2016).

9. Any other Contribution:

PhD/Post-Doctoral Fellowships offered at IROST, Iran

During the 15th meeting of COMSATS Coordinating Council, IROST offered 7 PhD scholarships (4 fully paid and 3 partially paid (50%) paid) and five-post-doctoral fellowships to experts from COMSATS' Member Countries. IROST reiterated the offer of scholarships during the 18th meeting of COMSATS Coordinating Council.

International Centre for Environmental and Nuclear Sciences (ICENS), Jamaica

Introduction

The International Centre for Environmental and Nuclear Sciences (ICENS) is based in Jamaica and became an important member of COMSATS' Network of Centres of Excellence in 1994. The Centre is located at Mona Campus of the University of the West Indies and has an attractive modern building on 950 sq. meters.



ICENS is a multi-disciplinary research centre whose work is based largely on the applications of the '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 the development and retention of local scientific talent of Jamaica.

Goals

The primary goals of ICENS are to: conduct multi-disciplinary research related to the environment; help provide solutions to developmental problems; and contribute to the growth and retention of a cadre of excellent scientists and technologists of Jamaica.

Services

Services provided at ICENS include:

- Elemental Analysis specializing in trace metals;
- Blood lead analyses;
- Radiation monitoring;
- Personal Dosimetry;
- Mineral exploration; and
- Consultations related to trace metals and their effects.

Research and Development Activities

The Centre's focused efforts in environmental geochemistry helps generate data that are applicable to agriculture, identification of natural resources, environmental assessment and preservation, man-made and natural





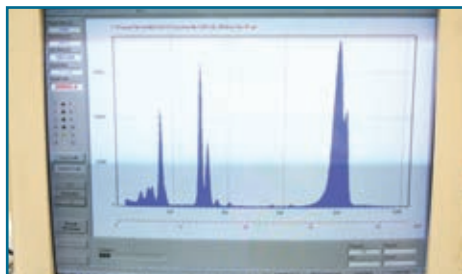
hazards, water-resource management, and the marine and coastal zones. These areas are fundamental to sustainable socio-economic development and reflect many of the priority areas of the Jamaica's National Science and Technology Policy.

The specific areas of interest of ICENS include:

- Geochemical Baselines;
- Relationship between the Geochemistry of the Natural Environment and Health;
- Agriculture and Food Security;
- Global Environmental Change and Potential Threats to Jamaica;
- Spatial Geoscience;
- Water-resource Management; and
- Peaceful Applications of the Atom.

Analytical and Support Facilities

ICENS has a diverse range of modern laboratories covering several aspects of the geochemical and nuclear sciences. The Centre is equipped with the following analytical and support facilities:



Nuclear Laboratory: The Nuclear Laboratory at ICENS operates two very powerful complementary nuclear techniques that provide for enormous analytical needs for a wide range of elements. These techniques are Neutron Activation Analysis and X-Ray Fluorescence.

Solutions Analysis Laboratory: In addition to instrumental techniques, such as Inductively-Coupled Plasma Optical Emission Spectroscopy and Atomic Absorption Spectroscopy, this laboratory uses standard wet chemistry methods, such as titrations and pH measurements to analyse samples in solution as required.



Sample Preparation: Prior to analysis, all samples collected by ICENS are logged, processed, labelled and stored in the sample preparation facility. The facility processes a range of materials, including rocks, sediments, soils, food, solutions

and human tissues.

Information Systems: The Information Systems Unit of ICENS was established in 1986 with a mandate to capture, maintain and make available in a digital medium, all the geo-referenced data collected and generated from the various projects along with any other relevant information.

Thermoluminescence Dosimetry (TLD): The TLD unit at ICENS provides thermoluminescence detection services to ICENS and external users of ionizing radiation (e.g. dentists, X-Ray technicians).

Local and International Cooperation

The research work undertaken at ICENS renders numerous opportunities for local and international cooperation. Funding for the research and development activities of ICENS comes from many sources. The major donors have been: the Environmental Foundation of Jamaica; the Government of Jamaica; Inter-American Development Bank; International Atomic Energy Agency; University of the West Indies; and the Organisation of American States.

For further details, please contact:

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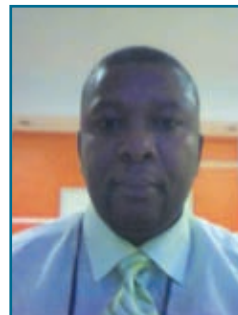
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Profile of Head of COMSATS' S&T Centre of Excellence

Mr. Charles Nathaniel Grant, Director-General ICENS, Jamaica

Mr. Charles Grant is the incumbent Director-General of the International Centre for Environmental and Nuclear Sciences (ICENS) located at the University of the West Indies, Kingston, Jamaica. He succeeded Dr. Richard Annells, on his retirement as the head of ICENS in September 2014.



Mr. Grant intends to continue the ground-breaking work on trace elements in the Jamaican bio-sphere and their relation to agriculture, health and economic development that was initiated by Professor Gerald Lalor (Emeritus Director-General and Chairman Board of Directors ICENS) and continued by Dr. Annells. Moreover, he plans to expand on one of the mandates of the Centre, “increase peaceful uses of atomic energy”. The main foci over the next three years will be the successful completion of the core conversion of the SLOWPOKE-II Research Reactor, as well as the implementation of regional nuclear safety and security programs.

Mr. Grant obtained his B.Sc. (Hons.) in Physics from the University of Surrey, England, in 1990. As part of the B.Sc. programme, Mr. Grant spent one year as an intern at the Standard Elektrik Lorenz company (now ALCATEL), in Stuttgart, Germany; where he provided support in the development of a 3-D modelling software and the design strategy of NMOS, PMOS and BiCMOS transistor. Mr. Grant obtained his M.Sc. in 1992 from the same University in Radiation and Environmental Protection, with specializations in Reactor Physics and Instrumental Neutron Activation Analysis (INAA).

Mr. Grant began his career at ICENS (formerly the Centre for Nuclear Sciences) in 1993. During his 21-year service at ICENS, he has successfully occupied several positions within the organization, including Reactor Manager and Head of the Nuclear Analytical Facilities. Mr. Grant has been intimately involved in the development and execution of many of the institution's major programs. These include: the Inter-American Development Bank (IDB) sponsored program, 'Geochemical Atlas of Jamaica'; International Development Research Centre (IDRC) funded program, 'Eco-Health Consequences of Cadmium in Jamaica'; International Atomic Energy Agency (IAEA) sponsored project, 'Nuclear Methods Applied to Socio-Economic Development'; Organization of American States (OAS) funded project, 'Mineral Contents of Indigenously Grown Foods in Jamaica', as well as Mexican Bilateral project, 'Geochemical mapping of soils and food crops using nuclear analytical techniques'.

Mr. Grant has been responsible for the development of the analytical and quality assurance systems for the Neutron Activation Analysis Laboratory. During his tenure as its Head, the laboratory was recognized at the regional and international levels as the “State of Practice” laboratory. Most recently, the strategic plan for the utilization of the ICENS Reactor Laboratory topped the list of 31 strategic plans, submitted by research reactor managers from around the world. The strategic plans were evaluated in a 2013 review by a group of international experts. Between 1994 and 2002, Mr. Grant also served as a part-time lecturer on Radiation Protection and Radiation Biology at the University Hospital of the West Indies School of Medical Radiation Technology.

At the international level, Mr. Grant has been designated as an IAEA expert in the field of Research Reactors and Neutron Activation Analysis. He was recently seconded on a short-term contract as a full staff member to the IAEA, where he was responsible for 14 national and regional projects in four countries. For the last four years, Mr. Grant has been a Board Member of the IAEA Regional Technical Agreement, ARCAL – Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean. He has been the National Coordinator for a regional IAEA project and one national project, as well as two bilateral projects with Mexico. Mr. Grant is the National Coordinator for the IAEA country declarations and additional protocols to the Safeguards Agreement; National Coordinator for the IAEA Radiation Safety Information Management System (RASIMS); the IAEA National Focal Point for Denial of Shipment of Radioactive Material; as well as member to several other national and university committees.

Mr. Grant has authored numerous papers published in international peer-reviewed journals; made presentations at international conferences; drafted technical reports; as well as contributed to book chapters. He is also a peer reviewer for several international Journals. In addition, he has constituted several newspaper articles and gave radio and television interviews.

Mr. Grant is married and has two children.

Contact Details

Mr. Charles N. Grant

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Participation in COMSATS' Activities

International Centre for Environmental and Nuclear Sciences (ICENS), Jamaica

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: ICENS-Jamaica has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
1 st Meeting	Prof. Dr. Gerald Lalor, Director General ICENS
2 nd Meeting	Prof. Dr. Gerald Lalor, Director General ICENS
3 rd Meeting	Prof. Dr. Gerald Lalor, Director General ICENS
9 th Meeting	Mr. Robin Rattray, Representative ICENS
10 th Meeting	Prof. Dr. Gerald Lalor, Director General ICENS
11 th Meeting	Prof. Dr. Gerald Lalor, Director General ICENS
15 th Meeting	Dr. Richard Annells, Director General ICENS
18 th Meeting	Dr. Andrew Gerard Murray Pearson, Head of Department, the University of the West Indies, Representative ICENS

3. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of ICENS was published in COMSATS Newsletter Volume 2: Issue No 6 (Nov-Dec 2010) and profile of Director-General of ICENS was published in COMSATS Newsletter Volume 4: Issue No 1 (Jan-Feb 2012) and Volume 6: Issue No 5 (Sep-Oct 2014).

Royal Scientific Society (RSS), Jordan

Introduction

The Royal Scientific Society (RSS) is the largest applied research institution, consultancy, and technical support service provider in Jordan, and it is a regional leader in the fields of science & technology. RSS was established in 1970, aiming to be the local and regional reference point of knowledge for science and technology, using modern engineering research as a base to empower economic development and social progress.



Vision

RSS has a vision to be the local and regional reference point, and knowledge leader for science and technology, using scientific and engineering research to empower economic development and social progress.

Mission

RSS' mission is to build and strengthen scientific and engineering research in the areas of greatest strategic value to Jordan for long-term competitiveness and development.

RSS Professional Technical Services

RSS provides expert testing services through over 25 specialised locally and internationally accredited laboratories, and prides itself on offering both the public and private sectors as unique scientific resource and a wide range of project expertise. Supported by more than 500 science specialists, researchers, technical support staff, highly skilled management, and faculty, the "RSS" has truly become recognized as a local, regional, international research and development hub.



A wide range of products are continuously inspected and tested to ensure conformity with national and international standards.

Moreover, in order to ensure compliance with the Ministry of Health (MoH) mandatory equipment servicing requirements as well as guarantee that all the equipment is in proper working order, the MoH contracts RSS to manage, service, and maintain the Kingdom's vast supply of medical equipment.



RSS Laboratories: RSS' Testing Centre is a leader in providing analytical testing services for the private and public sector. For over 45 years the Centre has been providing a wide scope of chemical and physical testing in food, environment, industrial, mechanical, electrical, construction materials, and industrial products. RSS laboratories are accredited by national and international agencies such as United Kingdom Accreditation Services (UKAS) and Jordan Accreditation Services (JAS) according to ISO-17025 in order to produce reliable scientific results for both the private and public sectors.

RSS provides its testing services through the following main divisions:

- Chemical Laboratories;
- Construction & Material Laboratories;
- Mechanical Laboratories;
- Industrial Laboratories;
- Environmental & Food Laboratories;
- Electrical Consumer Products services.

Metrology, Conformity and Engineering Maintenance: The Quality sector empowers "RSS" to cope with the dynamic and ever-evolving nature of international requirements with flexibility and efficiency. The Quality Sector is considered the basis of the Quality Infrastructure in Jordan. It includes:

- Jordan National Metrology Institute "JNMI";
- Conformity Assessment Centre;
- Engineering Maintenance / Bio Medical engineering services.

RSS Knowledge: RSS' Knowledge Centre's role is to be the reference point for scientific knowledge and research, providing data, and ideas to solve problems through a unique group of diverse experts with the highest levels of specification, world-class facilities, and networks in environment, construction, industrial technology, and information technology.

The Knowledge Centre aims to enhance cultural innovation and economic development evolving from technological change in Jordan. The sector covers areas of scientific research, industrial technology consultations and projects, environmental, energy, water consultations, and projects, as well as construction consultation and projects.

The Knowledge Centre consists of:

1. Water and Environment Centre (WE);
2. National Energy Research Centre (NERC);
3. Construction and Sustainable Buildings Centre (CSB);
4. Information and Communication Technology (ICT);
5. Applied Scientific Research.

RSS Outreach

RSS seeks to improve the standard of living all of Jordanians, especially the underprivileged population living in rural and remote areas of the Kingdom, with the objective of empowering individuals to initiate their own enterprises and become self-sufficient. It aims at reducing unemployment, combating poverty in urban, rural areas by integrating them to Jordanians business services to assist individuals in establishing new enterprises; or develop existing micro, small, and medium size business.



The Outreach Sector includes a diverse set of programmes that work closely with the local community to address different issues.

Princess Sumaya University for Technology PSUT

Founded in 1991, as the only private and non-profit university in Jordan, the Princess Sumaya University for Technology (PSUT) is owned by the RSS. PSUT's main mission is to educate students and qualify them to pursue careers in the fields of information and communications technology (ICT), electronics, computer engineering, communication engineering, and business. PSUT offers Bachelor of Science (B.Sc.) degrees in Computer Science, Software Engineering, Computer Graphics & Animation, Network, Computer Engineering, Electronics Engineering, Communications Engineering, Power & Energy Engineering, Networks & Information Security Engineering, MIS, Business Administration, E-Marketing, and Accounting. Also, Masters of Science (M.Sc.) degrees are conferred in Computer Science & Environmental Management, Computer Security & Criminology, Electrical Engineering, Enterprise System Engineering, as well as Global Master of Business Administration "MBA" in collaboration with Lancaster University in the United Kingdom. "PSUT" strives to create a culture of entrepreneurship among its students. PSUT is licensed with all its programs accredited by the Jordanian Higher Education Accreditation Commission.



Jordan's Technology Incubator (IPark)

IPark specializes in enabling and accelerating the growth of startup companies through its effective incubation facilities, globally recognized entrepreneurship programs, commercialization and intellectual property services, matchmaking opportunities with serious investors, and unique industry networking events.

Through its range of programmes, including the Queen Rania Centre for Entrepreneurship (QRCE), the Intellectual Property and Commercialization Office (IPCO), and the Bedaya Business Angel Network, IPark offers unique and comprehensive services that greatly increase the success opportunities for technology start-ups through better access to markets, finance and talent. These services include: Incubation services, Intellectual property and commercialization service, Entrepreneurship development and investment.

IPARK has continuously helped companies become market leaders. Today, our graduate companies are collectively valued at over US\$ 50 million, generate millions of dollars in revenues, and provide thousands of high valued jobs.

Queen Rania Centre for Entrepreneurship (QRCE)

QRCE is a non-profit organization established in 2004 to help develop Technology Entrepreneurship in Jordan. The Centre is part of PSUT, and plays the role of a national Centre of Excellence for Entrepreneurship. With the expansion of the role of the centre and the development in the strategic plan, QRCE is mandated to complete an ecosystem for entrepreneurship development and support in the country, starting with the business plan competition involving universities, entrepreneurs and professionals from different sectors. Working closely with local and international organizations, QRCE focuses on areas such as: Networking, Recognition & Awareness, Capacity Building & Support, and Funding.

IRADA Programme

IRADA - the Enhanced Productivity Centres Programme - is a national programme established in the year 2002 financed by Ministry of Planning and International Cooperation (MOPIC) and executed by RSS since 2006.

IRADA motivates Jordanians in developing readiness for entrepreneurship and empower them to become self-reliant and productive citizens, who are able to actively contribute to the socio-economic development of the Kingdom.



IRADA aims at addressing the problems of poverty and unemployment in the rural areas by creating jobs and improving the quality of life and standards of living for citizens.

Drivers of Change Institute

This unique campaign engages all sectors of Jordanian society to identify the key external and internal factors that are driving change within the Kingdom. The campaign seeks to foster a national discourse about the direction Jordan is heading in, how Jordanians can be more prepared, and, more importantly, what they can do as individuals to take responsibility for future. The campaign's methodology entails conducting national workshops designed to engage participants in dialogue while using the results of these workshops to build a body of knowledge that would form the basis for raising awareness, fostering debate, and facilitating actions.

Science for Society

The Central Training Facility provides training services designed to meet modern and emerging needs of business institutions, government agencies, and industrial corporations. It aims to improve the efficiency and skill-set of the workforce. The department is dedicated to supporting the Royal Scientific Society's mission of upgrading the human capabilities and technical skills in Jordan and the region through the diverse programmes offered.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

HRH Princess Sumaya Bint El Hassan, President RSS, Jordan

Her Royal Highness Princess Sumaya bint El Hassan is a leading advocate for science as a catalyst for change in the Arab World. The Princess has dedicated herself to fostering an environment for the development of solutions to the pressing national and regional issues. Her focus on science in education, research and innovation is geared to encouraging sustainable development for the benefit of all sections of the Jordanian society. Considering the human capital as Jordan's greatest asset, the Princess is committed to maximizing the potential of young talent through the provision of quality education and professional opportunities.



Princess Sumaya chairs the Board of Trustees of the Princess Sumaya University for Technology (PSUT), which was founded in 1991. She is dedicated to reinforcing PSUT's commitment to excellence in education and making the university a regional hub for I.T. based research and development.

In October 2006, HRH was appointed as the President of the Royal Scientific Society (RSS) – Jordan's leading applied research institute – which has been providing support to national level initiatives via scientific research and technical application in the country for more than four decades (www.rss.jo). As the President of RSS, HRH has spearheaded a restructuring programme for the organization, re-aligning the efforts of RSS to achieve its mission and objectives. The Princess has been successful in steering the organization to a sound fiscal footing while ensuring that RSS continues to play an important role in Jordan's economic development and prosperity.

Princess Sumaya has been instrumental to the progress of science and technology in Jordan. She has been actively contributing to the Higher Council for Science and Technology (HCST), which acts as a national umbrella organization for various S&T activities in Jordan. On April 17th 2007, His Majesty King Abdullah II inaugurated the El Hassan Science City (EHSC), with HRH Princess Sumaya as President of EHSC. The princess continues to build on her father's legacy of scientific institution-building for the benefit of humanity under the banner of 'Science for Peace'.

El Hassan Science City seeks to catalyse social and economic progress for meaningful improvement in the quality of people's lives through scientific education, research, development and enterprise in the fields of Information & Communications Technologies, Clean Technologies and Human Safety & Security. In the wake of the importance of information aggregation in dealing with future

challenges, HRH has undertaken the Directorship and Chairpersonship of the National Campaign for Public Awareness of the Drivers of Change, a Jordanian initiative that seeks to foster the understanding, and debate on the factors that are driving change in the Kingdom. Under the direction of the Princess, the Campaign will help create a viable course of action for the local communities and Government in order to meet the future developmental challenges of the country.

Princess Sumaya is member of the Board of Directors of the Amman Baccalaureate School since 2005. She strongly believes in the importance of creative education not only at University level, but also at school level, and sees it as a key component for driving positive change to improve the quality of peoples' lives in the region. In 2009, Princess Sumaya became a member of the Jordan Council of Higher Education.

The Princess is an avid archaeologist and is closely involved with the work of the British Institute in Amman for Archaeological Research and the Council for British Research in the Levant. She is also the Patron of the Wadi Feynan project, an archaeological excavation in southern Jordan, and has worked with the Ministry of Tourism and Antiquities on several projects relating to the conservation and development of archaeological sites in Jordan.

More recently, under the direction of Her Majesty Queen Rania Al Abdullah, Princess Sumaya was invited to become the Vice Chairperson of the Board of Trustees of the Jordan Museum, where she is overseeing the development of Jordan's first national museum. Princess Sumaya is the Honorary Patron of the Jordan Computer Society and of several charitable organization. In recognition of her support for the promotion of science, research, and technology, HRH Princess Sumaya has been conferred with a number of local, regional, and international awards, including:

- Albert Einstein Medal for Distinguished Achievement (University of Ulm, Germany, 2009);
- Lazio 'Between Europe and the Mediterranean' Prize (Italy, 2009);
- Grand Cordon of the Order of the Star of Jordan (Wisam al-Kawkab al-Urdani) (King Abdullah II of Jordan, 2006);
- The Order of the Crown from Her Majesty Queen Beatrix of Netherlands;
- Awards from the Governments of France and Sudan.

Contact Details

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Participation in COMSATS' Activities

Royal Scientific Society (RSS), Jordan

1. Date of Affiliation to COMSATS: 30th September 1996
2. Participation in COMSATS' Coordinating Council Meetings: RSS-Jordan has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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2 nd Meeting	Dr. S. Suradi, Director Industrial Chemistry Centre (ICC), RSS Dr. Nageh Akeel Jerics, Industrial Chemistry Centre (ICC), RSS
9 th Meeting	Dr. Bassam hayek, Director Technology Transfer Centre (TTC), RSS
10 th Meeting	Dr. Rafat Ahmad, Director Industrial Chemistry Centre (ICC), RSS
11 th Meeting	Dr. Rafat Ahmad, Director Industrial Chemistry Centre (ICC), RSS
15 th Meeting	Dr. Nabeel Ibrahim Al-Fayoumi, Vice President Testing, Quality & Technology, RSS
18 th Meeting	Eng. Abeer Arafat Manager of Communication and External Affairs, RSS
19 th Meeting	Eng. Abeer Arafat, Manager, Communication and External Affairs, RSS

3. Hosting of COMSATS' Coordinating Council Meeting: RSS-Jordan hosted 9th Meeting of COMSATS' Coordinating Council, held on March 01-02, 2006, in Amman, Jordan.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 15
5. Organization of COMSATS Activities: RSS-Jordan has organized following joint activities in collaboration with COMSATS:
 - 3rd International Workshop on Applications of ICTs in Education, Healthcare and Agriculture, 31st May to 1st June 2016, Amman, Jordan;
 - 2nd COMSATS-ISESCO International Workshop on Internet Security: Enhancing Information Exchange Safeguards, September 16-20, 2012, Amman, Jordan;
 - International Training Workshop on Corrosion and Corrosion Control,

August 17-20, 2008, Amman, Jordan; and

- International Conference on Medicinal Plants, October 09-11, 2004, Amman, Jordan.
6. Participation in COMSATS' International Thematic Research Groups (ITRGs): RSS-Jordan is member of the COMSATS' ITRG on 'Information and Communication Technologies', and participating in its research project "Enabling ICT Applications using Long Distance Wi-Fi Networks" being led by COMSATS Institute of Information Technology (CIIT), Pakistan.
7. Participation in COMSATS' Publications:
- i) COMSATS Newsletter: Profile of RSS was published in COMSATS Newsletter Volume 1: Issue No 2 (Mar-Apr 2009) and profile of President of RSS was published in COMSATS Newsletter Volume 3: Issue No 5 (Sept-Oct 2011).
 - ii) COMSATS' Journal 'Science Vision': Research articles received from RSS-Jordan have been published in COMSATS' Journal 'Science Vision' Vol.4, No.3, and Vol.4, No.4.

Al-Farabi Kazakh National University (KazNU), Kazakhstan

Introduction

Al-Farabi Kazakh National University is the oldest classical university of the Republic of Kazakhstan and the leading institution in the system of higher education of the country, which was the first to receive the state certification and to justify its right to undertake academic activity in all specialties and at all levels. Dr. Galimkair Mutanov is holding the position of Rector of Al-Farabi KazNU since 2010.



The leading institution in terms of the general rating of the Kazakhstani universities, Al-Farabi KazNU was the first winner of Presidential Award of the Republic of Kazakhstan “for achievements in the area of quality” in the history of the country, winner of the Award of the Commonwealth of Independent States (CIS) countries for achievements in the area of quality and services. The University was the first among the universities of Kazakhstan and Central Asian countries to sign the Great Charter of Universities in Bologna. It has successfully received the international certification for correspondence to the system of quality management (SQM), the requirements of international standards, ISO 9000:2000, and has obtained the certifications from the largest global certification centers – the International Certification Network IQNET.

The University has enormous educational, scientific, spiritual, innovation and production potential that is aimed at: training and producing highly qualified professionals; integrating into the global educational space; and undertaking fundamental and applied research, and their implementation into the production.

The University has 15 faculties; 65 departments; 7 scientific research institutes; a Scientific & Technological park; 4 institutes and 35 social and humanitarian profile scientific centers; more than 2,000 professors; doctors; Ph.D, more than 10 academicians from the largest academies; about 30 honored representatives of the Republic of Kazakhstan; 36 laureates of State and nominal awards of the Republic of Kazakhstan and 51 laureates of the young scientists' awards; and 45 fellows of state scientific fellowships. More than 18,000 undergraduate and graduate students at the multilevel system of higher professional education study at the University. Human resources have been trained under 88



disciplines at a bachelors level, 86 disciplines at masters level, and 65 disciplines of Ph.D. programmes. Moreover, in 2014, ten former research institutes of the Academy of Science (currently “Gylym Ordasy”) have been integrated with the Al-Farabi KazNU.

Mission

The University has the mission of formation of personnel potential – highly qualified specialists competitive in domestic and international labor market, the experts of a new formation – who meet the modern intellectual requirements.

Vision

KazNU has the vision to enter the world's top 200 leading research universities.



Purpose

Transformation from classical university into a national research university taking into account the world experience and on the basis of effective integration of education, science and innovation.

Research Activities

The research work of the University aims to increase scientific and innovative component in accordance with the priorities of scientific and technological development of the Republic of Kazakhstan and the global trends of science and technology development.

In 2015, 488 projects were implemented with a total funding of 6.560 billion tenge (\$ 18.1 million), including:

- 340 projects with funding from Ministry of Education and Science of Kazakhstan;
- 1 project of the International Science and Technology Center;
- 2 projects of JSC “National Agency for Technological Development”;
- 10 projects by program “International cooperation and international scientific technical programs and projects for 2013-2015” of Ministry of Education and Science of Kazakhstan
- 58 projects grants of the international organizations and funds;
- 77 projects developed in collaboration with national companies and private enterprises.

Scientific research at the University is carried out by highly qualified personnel, including 10 academicians and 7 corresponding members of the National Academy of Sciences of Kazakhstan (NASK), more than 480 doctors, 860 candidates of



science, and 120 Ph.D holders.

University scientists implemented more than 58 funded projects with international foundations and organizations, such as: TEMPUS - 19 (including training); Erasmus Mundus – 11 (including training); projects under the intergovernmental cooperation of MES RK (Ukraine-Belarus-Kazakhstan-China) – 10; DAAD – 6; NATO - 4; Japan Foundation – 4; Volkswagen Stiftung - 2 and others.

In 2015, the University's scientists published 241 articles (or 25% of all publications of Kazakhstani authors) in top international peer-reviewed journals, indexed by Thomson Reuters and Scopus data bases.

Innovation and Breakthrough Projects

There are 18 University breakthrough projects; 4 international, 7 state funded, 3 industrial, 4 by the university.

Works on the projects of the "Technology Commercialization" program funded by MES RK and the World Bank are continued, at the present time the results of them are successfully converted into the real sector of economy of Kazakhstan:

- Creation of production of new hydrogel medical forms of phytopreparations from the vegetable raw materials of Kazakhstan by Center of Physical Chemical methods of research and analysis;
- Practical application of isotope ratios of natural radionuclides in hydrometallurgy of uranium and radioecology by Center of Physical Chemical methods of research and analysis;
- Development of methods for producing self-renewing composite coatings by Center of Physical Chemical methods of research and analysis.



Infrastructure

With the land area of 100 hectares, the University facilities and buildings 335,928 sq.m, besides Sports and healthcamp, which is located by the Issyk-kul lake (area 17 hectares).

The property of the University includes:

- 14 academic buildings;
- 16 student dormitories;
- Student's Palace;
- Scientific library;
- Food production facility, Internet center;
- Sport complex and stadium;
- "Keremet" student's service center;
- Sports and healthcamp on the Issyk-kul lake;
- Agrobiostation (Janatalap).

Building of Innovation Cluster, and Medical and Biological Cluster started in 2015 at the University campus. The overall cost of building of these two clusters is 500 million \$, including foreign investments.

Scientific Achievements

The contribution of KazNU to the general flow of the Kazakhstan publications in the Scopus Database for 2010-2015 was 14,8%. According to the Web of Science Database, 16,7 % of Kazakhstani publications in 2010-2014 were contributed by the Al-Farabi KazNU staff members. According to the international bases such as Thomson Reuters and Scopus, in general, every fifth high-rated publication from the Republic of Kazakhstan authored by the KazNU scientists.

For the first time in the framework of the international student project "UNIFORM" with the University of Tokyo the scientific and technological nanosatellites "Al-Farabi-1" and "Al-Farabi-2" are designed and assembled. Several samples of nanosatellites, designed on the basis of the Scientific and Technological Park of Al-Farabi KazNU, successfully passed joint tests in the Rocket and Space Corporation "Energia" and the Technical University of Berlin, in the near future the first of them will be launched from the board of the International Space Station.



Foreign Patents

Every year scientists of the University have international and national patents approved, in countries such as the USA, European Union countries, Russia, China, etc.

In 2015, three US Patents have been received:

1. 8,945,492 "Method for extraction of beryllium from the minerals of genthelvite group when processing the raw minerals (ores, concentrates)";
2. 8,945,493 "Method for extraction of beryllium from raw genthelvite (danalite, genthelvite, helvite) and bertrandite (chrysoberyl, euclase, bertrandite) mineral groups when processing the raw minerals (ores, concentrates)";
3. 9,004,074 "Method for extraction of nicotine from tobacco raw materials".

Capacity-Building Programs

Every years 20-25 teaching staff of KazNU receive grants of the Ministry of Education and Science of the Republic of Kazakhstan under the head "The best teacher of high school" to enhance the level of their professional skills. The amount of the grant is 4 million tenge (~ US\$11,000).

In 2015, 297.2 million tenge (~\$0.8 million) of the Ministry was utilized for scientific training, participation in conferences.

International Cooperation

Al-Farabi KazNU has established partnership relations with 418 largest world universities and various international organizations including UN, NATO, Shanghai Cooperation Organization, British Council, DAAD, Alliance Française, Confucius Institutes, USAID, etc., as well as and foreign scientific funds. Annually, KazNU participates in international educational projects as TEMPUS and Erasmus Mundus, held within the framework of the European Commission.

Today KazNU is the member of international associations such as International Association of Universities, Eurasian Association of Universities, European Society for Engineering Education (SEFI), International Association for the Exchange of Students for Technical Experience, and International Federation of Engineering Education Societies.

For further details, please contact

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Galimkair Mutanov, Rector Al-Farabi KazNU, Kazakhstan

Dr. Galimkair Mutanov is a professor of technical sciences and the incumbent Rector of Al-Farabi Kazakh National University (KazNU), Kazakhstan.



He graduated from Kazakh Polytechnic Institute, majoring in “Automatics and Remote Control” in 1979 and worked for two years as research fellow at the Moscow Institute of Steel and Alloys. During 1986-1993, he completed his graduate and doctoral studies at Moscow State Mining University. His Ph.D doctoral theses are dedicated to the theory and practice of automatic process control with the use of elements of artificial intelligence. In his 36 years of academic career, Galimkair Mutanov became one of the youngest doctors of technical sciences and a well-known scientist in the field of technical and socio-technical spheres in the country. Other areas of the scientific interest of Prof. Mutanov are: applied mathematics, econometrics, science and higher education policy and governance technological processes management, case management, risk management, modeling and management of socio-economic systems and processes.

Dr. G. Mutanov has previously served as the Rector of the North Kazakhstan State University (1995-2002), the first Vice-Minister of the Ministry of Education and Science of Kazakhstan (2002-2003), and the Rector of East Kazakhstan State Technical University (2003-2010). He has also worked as the Chairman of the Board of Directors of the Center for Engineering and Technology Transfer and Scientific and Technological Park “Altai”. Since 2010, Dr. G. Mutanov has been serving as the Rector of Al-Farabi KazNU, where he is engaged in a goal-oriented work on transformation of the university into high level Research University.

Under his guidance, Al-Farabi KazNU, has immensely increased its standards in a short period, moving forward to a position among 300 top universities in QS World University Ranking, and according to the ranking results of international organization (Great Value Colleges), it is ranked among the 50 most technologically advanced universities in the world (31st place). Now Al-Farabi KazNU is the regional hub of a UN programme for sustainable development and the UN ‘Academic Impact Programme’, organizing several large-scale international conferences dealing with the 10 principles of the UN.

Dr. G. Mutanov has created a scientific school of management in the technical and socio- economic fields and trained more than forty candidates and doctors of sciences. He is the Academician of more than ten national and international

Academies.

Dr. G. Mutanov's contributions to education and science have been recognized through national and international awards and honours, such as: Barys Award (III) and Parasat Award, Chevalier of the Order of the Academic Palm (France), the Chevalier Cross of the Order of Merit of the Republic of Poland, the Badge of a 'Special Sign of the President of the Republic of Kazakhstan', Golden Medal of M. Curie, the Order of the CIS (Moscow), Golden Medal of 'United Europe' (Oxford), 'Medal for Outstanding Achievements in Science and Innovation' Higher Engineering Institute of Lisbon (Portugal), prestigious ranks: 'The Honorable Engineer of the Republic of Kazakhstan', and 'The Best Inventor of the Republic of Kazakhstan'. Moreover, Prof. Mutanov has been awarded the diploma 'Altyn Zhyldyz' (Golden Star) of the Academy of Journalism of Kazakhstan for publishing the unique series of books 'Onegeli Omir' (Enlightening Life).

Dr. G. Mutanov is a member of the World Academy of Art and Science; the Presidium of the Kazakhstan National Academy of Natural Sciences; and the Royal Economic Society. He has also contributed to a number of national and international organizations as President, including: Kazakhstani Office of the International Society for Engineering Education IGIP (Switzerland); Kazakhstan Society for Engineering Education (KazSEE) of International Federation for Engineering Education; and the National Academy of Higher Education of Kazakhstan.

He is an author of more than 400 scientific publications and 20 monographs, textbooks, teaching materials in the management of technical, social and economic processes, published in Kazakhstan, USA, Czech Republic, Sweden, Switzerland, among others. In 2014, Springer Publishing company published his book 'Mathematical Methods and Models in Economic Planning, Management and Budgeting', which has been acclaimed by experts. Dr. G. Mutanov has more than 40 patents and inventions. In 2014, Dr. G. Mutanov and a group of the University scientists had two patents registered with the US Patent & Trademark Office (USPTO), USA.

Contact details:

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Participation in COMSATS' Activities

Al-Farabi Kazakh National University (KazNU), Kazakhstan

1. Date of Affiliation to COMSATS: 13th May 2015
2. Participation in COMSATS' Coordinating Council Meetings: KazNU has participated in the following Meeting of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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18 th Meeting	Prof. Tlekkabul Ramazanov, Vice-Rector for Research and Innovative Affairs, KazNU
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19 th Meeting	Prof. Tlekkabul Ramazanov, Vice-Rector for Research and Innovative Affairs, KazNU
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3. Participation in COMSATS' International Thematic Research Groups (ITRGs): KazNU is member of the COMSATS' ITRG on "Natural Products Sciences", and participating in its research project "Drug Discovery from Nature for Neglected Diseases" being led by International Center for Chemical and Biological Sciences (ICCBS), Pakistan.
4. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of Rector KazNU was published in COMSATS Newsletter Volume 7: Issue No 4 (Jul-Aug 2015).

National Mathematical Centre (NMC), Nigeria

Introduction

The National Mathematical Centre (NMC), Abuja, was established by Decree N0.40 of 1989 (CAP 58 of the Laws of the Federation, 2004), to develop appropriate initiatives and resources of international standing for re-awakening and sustaining interest in the Mathematical Sciences and their applications at all levels of the Nigerian education system.



Vision

NMC has a vision to become a world-class Centre of Excellence for research and training in mathematical sciences, capable of promoting the development and socio-economic impact of mathematical sciences in Nigeria, as well as using these to solve important scientific and technological problems.

Mission

To develop appropriate initiatives and resources of international standing for re-awakening and sustaining interest in the mathematical sciences and their applications in life, and by so doing produce relevant specialists and teachers at all levels of our educational system.

Mandate

- Train and develop high-level personnel in mathematical sciences for Nigerian and African institutions;
- Create a resource centre to serve national and international communities as a focal point for advanced research and training in the mathematical sciences and its applications;
- Enhance collaboration among mathematical scientists, especially between young Nigerian scientists, and other advanced scientists from within and outside Nigeria;



- Identify and encourage young talent in the mathematical sciences;
- Prepare Nigeria for a leading role in the mathematical sciences;
- Attract good mathematical scientists from all over the world to serve in Nigeria;
- Encourage and support activities leading to the improvement of the teaching and learning of the mathematical sciences at all levels;
- Provide facilities for scientific conferences and publication of the proceedings arising therefrom;
- Achieve set national goals in the development of mathematical sciences;
- Conduct series of research lectures for advanced postgraduate as well as post-doctoral students and other participants based on a set of pre-assigned research papers, with the objective of generating research questions that would be collated, discussed and used to determine new research directions.



Strategies

- The Centre, in an attempt to demystify Mathematics, produced and published innovative teaching modules, student workbooks, texts and mathematical games for use in primary and secondary schools.
- In order to inculcate numeracy culture in Nigerian pupil and student, especially through the use of models, and shapes as the primary instrument for mathematics, the Centre designed innovative mathematics kits. In pilot phase, these kits including manipulative devices (models, shapes, tools and equipment, as well as textbooks, workbooks and games) have been distributed to schools nationwide. Primary school mathematics teachers have also been trained to use these kits for effective teaching of the subject, as well as to foster mathematics consciousness in both students and teachers.
- Mathematics Improvement Programme (MIP) has been designed to address the poor performance in Mathematics of students in public examinations and is based upon a “Student-Teacher-Friendly” teaching methodology for better teaching and learning of Mathematics in schools.
- The Classical Mental Arithmetic (CMA) is a form of calculation which is solely done by performing mathematical calculations mentally, without using any physical or external instruments, such as a computer, calculator, paper or pencil. CMA Mental Arithmetic (both hand and abacus system) taps the mental capabilities of human brain to solve mathematical problems with speed and accuracy.



Recent Achievements

UNESCO Chair Programme on Mathematics in National Mathematical Centre Abuja: Consequent upon the MoU signed between the NMC and UNESCO, “The UNESCO Chair Programme on Mathematics” at National Mathematical Centre Abuja was formally inaugurated by the Representative of the Honorable Minister of Education who also unveiled the Logo and banner of the Chair. Other dignitaries who took part in the Event included the Secretary General Nigerian National Commission for UNESCO (NATCOM), Officials of UNESCO, National Universities Commission (NUC), and Vice Chancellors of several Nigeria universities.

Mathematical Sciences Graduate Foundation Development and Entrepreneurship Programme: In order to administer high quality training for the unemployed mathematical sciences graduates (Mathematics, Theoretical Physics, Computer Sciences, Statistic and Mathematics Education), the Centre organized a course to provide intensive training in some of the core undergraduate courses. Twenty successful candidates were selected to participate in Foundation Postgraduate courses, after whom the Centre secured for them admission in local and foreign universities on full scholarship, to enable them to pursue various postgraduate programmes in mathematics and mathematical sciences.

International Workshop on Gifted Education and International Competitiveness: The theme of the workshop was mainstreaming the ideas of gifted education into regular secondary schools and in line with best global practices. The workshop objectives included the acquisition of skills for identification and management of gifted children.

Pan-African Congress of Mathematicians (PACOM): The Pan-African Congress of Mathematicians (PACOM) is an international event that brings together distinguished mathematicians from across the African Continent, who have made mark in mathematics and mathematical sciences. The theme of the 2013 Congress organized by NMC was ‘Contemporary Development in the Mathematical Sciences as Tools for Scientific and Technological Transformation of Africa’. The event enhanced collaboration among Nigerian mathematical scientists and their colleagues from across the continent and beyond.

Hosting of the 2013 Pan African Mathematics Olympiad (PAMO): The Pan African Mathematics Olympiad (PAMO) is an annual event organized by the African





Mathematical Union. The objective is to encourage talent and exchange information on curricula and teaching methods in mathematics across the African continent. The 2013 edition was hosted by NMC with participation from 12 countries across Africa.

The Guinness World Record of Conducting the Largest Mathematics Lesson: On 1st July, 2013, NMC broke the Guinness official world record for the largest mathematics lesson, at the International Conference Centre, Abuja. The participants were school pupils. A total of 2,381 participants from 76 schools belonging to 21 states of the Federation participated in the event. The figure surpassed that of the earlier world record of 2,312, achieved by Brahma Kumaris, in India, on 17th December 2012.

Capacity-Building

High Level Scientific Activities: The Centre organizes foundation postgraduate courses, research oriented courses and national conferences, seminars, for University Lecturers aimed at training and developing high-level personnel in mathematical sciences, including mathematics, statistics, computer science, mathematical sciences; Education and Theoretical Physics for Nigeria and African Institutions, to address the brain drain characterizing our tertiary Institutions.

Post-Graduate Training Programme - CIIT-COMSATS Scholarship Scheme for COMSATS' Member States: In 2014, the Centre under the above scheme sent seven of its staff members to CIIT Pakistan, some of whom have since returned with Masters degrees in different programmes. Six (6) other beneficiaries are currently pursuing Master of Science degrees in Mathematics, Physics and Computer Science under the programme. These staff members are channeling the knowledge acquired from this programme, to help them achieve the Centre's mandate and, by extension, the development of Science and Technology in Nigeria.

Visiting Scientists scheme: In its efforts to expand the number of experts available and to avail more expertise for its research facilities, the Centre offers 'short-term research visitors' scheme, under which researchers visit the Centre for a brief period for their academic endeavours.

Train the Trainers and Re-Training Workshops: The Centre conducts series of workshops for teachers and inspectors working for mathematical sciences education. These workshops are aimed at strengthening the base for mathematical

sciences and for developing initiatives for the improvement of education in mathematics and mathematical sciences.

Participation in the 2015 International Olympiads: The Centre led the Nigerian contingent to participate in the 2015 International Mathematics Olympiads.



National Olympiad and Rubik's Cube Competitions: The Centre organized 2015 National Rubik's Cube Competition and Olympiad Award for secondary school students from all the States of the Federation. More than 2,000 medals (gold, silver and bronze), along with other incentives, like laptops, were awarded to the distinguished students.

International Academic Cooperation

The Centre has academic linkages/ relationships with international donor agencies, similar research institute, parastatals, and organizations including UNESCO, COMSATS, TWAS, ICTP, IMPA, IMO, IBM. These linkages are utilized for identifying sources/opportunities for funding, technical support and cooperation, to help achieve the Centre's mandate, especially for facilitating collaborative research with relevant research centres, universities and institutions.

NMC is the Lead Centre for COMSATS' International Thematic Research Group (ITRG) on Mathematical Modeling. The Centre hosted the NMC-COMSATS-ISESCO International Conference on Mathematical Modeling and 2nd Meeting of the ITRG on Mathematical Modeling, 28-30 December, 2015. The Centre had hosted the Foundation Meeting of ITRG on 2nd December 2014. The events had in attendance representatives from Jordan, Bangladesh, Morocco, Pakistan, Tanzania, Sri Lanka, Senegal, and various universities in Nigeria.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. A.R. Tunde Solarin, Director NMC, Nigeria

Prof. Adewale Roland Tunde Solarin is the Director/Chief Executive of National Mathematical Centre (NMC), Abuja, Nigeria. He has been serving as the Coordinator of Mathematics Programme at NMC. From December 2004 to December 2006, Prof. Solarin served the University of Agriculture, Abeokuta-Nigeria, as Deputy Vice-Chancellor and from 2000 to 2006 as a member of the Governing Council. He holds a Ph.D in mathematics with a strong background in statistics. Prof. Solarin has taught various undergraduate and postgraduate courses in Mathematics, Statistics and Computer Science for over 31 years in Nigeria and abroad. He played a key role in establishing the Quality Control Society of Nigeria in 1990. Consequently, he became the founder National President of the Society in the same year, a position he held till December 1994.



Since 1991, Prof. Solarin has been the principal consultant in implementing Total Quality Management (TQM) practices in many companies in Nigeria, including UACN Plc, which is ranked as the biggest private conglomerate in Africa. He has been the principal facilitator to foremost consulting outfits on TQM in Nigeria to design and conduct workshops on topics including TQM for managers; Training-the-Trainers in TQM; Building world-class customer-oriented culture in the banking industry. Prof. Solarin is also the Team Leader of the Inter-university Research Team on Quality Management (IRTQM), which is a university-based organization involved in conducting research into TQM implementation and development and organizing annual national and international conferences on TQM with the support of Nigerian private sector. Over the years, Prof. Solarin has played a leading role in the design and execution of TQM related training activities. These include:

- i. Quality and Productivity Improvement Project at Litho Factory, Bordpak Premier Packaging (BPP), Apapa – A division of UACN Plc (1992-1993);
- ii. Total Quality Management (TQM) Implementation in Bordpak Premier Packaging (BPP), Apapa (1994-1996)
- iii. Total Quality Management (TQM) Implementation in Eagle Package Printing, Otta (1993-1995);
- iv. TQM for Managers' Training Workshop for Lion of Africa Insurance PLC (1994);
- v. Training-the-Trainers in TQM for First Bank PLC Training Managers – Organized by Rockleads Limited (1994-1995);
- vi. Building World-Class Customer-Oriented Culture in the Banking Industry Workshop for First Bank Nig PLC Managers (1994-1995);
- vii. ISO-9002 Certification Programme for Vita Foam Nig. PLC (1999-2000).

As a researcher, Prof. Solarin has published more than 30 papers in statistics and mathematics in internationally reputable journals. He has written more than 20 papers on TQM and related topics for journals, seminars, workshops and conferences. To facilitate his research, Prof. Solarin has also written a number of computer programmes. As a well-respected academician, he has supervised a number of theses of students (B.Sc., M.Sc., Ph.D., PGD, MBA, and MBF) in topics related to Mathematics, Statistics, Quality Control, Computer Science, and Business Management. He also served as an external examiner for under-graduate and post-graduate programmes to universities in Nigeria and abroad, including University of Dar-es-Salaam, Dar-es-Salaam, Tanzania (2004-2006); and Makerere University, Kampala, Uganda (2006-2008). He is a member of the science accreditation team of the National Universities Commission (NUC) for Academic Programmes; and another team for accreditation of private universities.

Prof. Solarin pursued under-graduate studies with scholarship from the Nigerian Federal Government, and acquired for his M.Sc. and Ph.D. degrees studying at the University of Ife on scholarship of merit. He bagged the first Ph.D. (Mathematics) from Obafemi Awolowo University, Nigeria. Due to his high academic performance, Prof. Solarin was awarded a number of other international scholarships and fellowships including: Italian Foreign Affairs Fellowships (1980, 1981 & 1983); International Mathematical Union (IMU) – ICM-90 Scholar, Kyoto, Japan; and Deutscher Akademischer Austauschdienst (DAAD) - German Academic Exchange Award for Senior Academics (1996).

In 1993, Prof. Solarin received a Letter of Commendation from the Head of State of the Federal Republic of Nigeria, for designing a programme for achieving National Excellence using TQM principles and philosophy. In 1999, he had the honour of delivering the 9th University of Agriculture Abeokuta Inaugural Lecture titled 'Total Quality – A Mathematical Panacea for National Productivity Improvement'. Prof. Solarin is a member of a number of professional organizations including: (i) Quality Control Society of Nigeria (QCSN) - Life Member; (ii) Nigerian Mathematical Society (NMS); (iii) Science Association of Nigeria (SAN); (iv) Mathematical Association of Nigeria (MAN); and (v) American Mathematical Society (AMS).

Contact Details:

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Participation in COMSATS' Activities

National Mathematical Centre (NMC), Nigeria

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: NMC-Nigeria has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
1 st Meeting	Prof. James Wzeilo, Director NMC
2 nd Meeting	Prof. R.F.A. Abiodun, Director NMC
4 th Meeting	Prof. A.O.E. Animalu, Director and Chief Executive, NMC
5 th Meeting	Mr. M. Fregene, Counsellor, NMC
6 th Meeting	Prof. Sunday O. Iyahan, Director and Chief Executive, NMC
7 th Meeting	Prof. Sam O. Ale, Director and Chief Executive NMC
8 th Meeting	Prof. Sam O. Ale, Director and Chief Executive NMC
9 th Meeting	Prof. Sam O. Ale, Director and Chief Executive NMC
10 th Meeting	Prof. Sam O. Ale, Director and Chief Executive NMC
11 th Meeting	Prof. Sam O. Ale, Director and Chief Executive NMC
12 th Meeting	Prof. Sam O. Ale, Director General NMC
14 th Meeting	Mr. Clement Olajide Adeyemo, Registrar NMC
15 th Meeting	Mr. Clement Olajide Adeyemo, Registrar NMC
16 th Meeting	Prof. Adewale Roland Tunde Solarin, Director/Chief Executive, NMC Mr. Olutunji Oladejo (Liaison Officer of COMSATS), NMC Mr. Gregory Olukayode Obayomi, Special Assistant to Director, NMC
17 th Meeting	Prof. Adewale Roland Tunde Solarin, Director/Chief Executive, NMC Mr. Olutunji Oladejo (Liaison Officer of COMSATS), NMC Mr. Gregory Olukayode Obayomi, Special Assistant to Director, NMC
19 th Meeting	Prof. Benjamin O. Oyelami, Professor NMC

3. Hosting of COMSATS' Coordinating Council Meetings: NMC-Nigeria hosted 12th Meeting of COMSATS' Coordinating Council, held on April 28-29, 2009, in Abuja, Nigeria.
4. Participation in COMSATS' International Conferences/Symposium/Workshops: Number of Participants: 2

5. Organization of COMSATS Activities: NMC-Nigeria has organized following joint activities in collaboration with COMSATS:

- International Conference and COMSATS' Research Group Meeting on Mathematical Modelling, December 29-30, 2015, Abuja, Nigeria;
- Foundation Meeting of COMSATS' ITRG on Mathematical modeling and International Conference on 'Modeling and Simulation of Climate Change and Environmental Protection', December 2014, NMC-Nigeria; and
- National Workshop on establishing a Pilot Project for Science Park Development, July 2009, Nigeria

6. Participation in COMSATS' International Thematic Research Groups (ITRGs): National Mathematical Centre (NMC) is Lead Centre of International Thematic Research Group on "Mathematical Modeling". NMC is executing a joint research project entitled "Mathematical Modeling and Simulation of Air and Water Pollution: Effects and Remedies" under the above mentioned ITRG. The Foundation Meeting of COMSATS' ITRG on 'Mathematical Modeling' was jointly organized by COMSATS and the Lead Centre, on 2nd December 2014, in Abuja, Nigeria, on the sidelines of NMC-COMSATS International Conference on 'Modeling and Simulation of Climate Change and Environmental Protection' (December 1-2, 2014, Abuja, Nigeria).

7. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of NMC was published in COMSATS Newsletter Volume 3: Issue No 2 (Mar-Apr 2011) and profile of Director-General of NMC was published in COMSATS Newsletter Volume 4: Issue No 5 (Sept-Oct 2012).

8. Any other Contribution:

Hosting of COMSATS Consultative Committee Meeting: 1st Meeting of COMSATS Consultative Committee was held on 27th April 2009, in Abuja, Nigeria, in conjunction with the 12th meeting of COMSATS Coordinating Council, and was hosted by COMSATS' Centre of Excellence in Nigeria, the National Mathematical Centre (NMC).

COMSATS Institute of Information Technology (CIIT), Pakistan

Introduction

COMSATS Institute of Information Technology (CIIT) was founded in 1998 with the establishment of its first campus in Islamabad, Pakistan. In August 2000, the Federal Government of Pakistan granted CIIT the status of a degree-awarding institute through the promulgation of its Charter. Besides its principal campus in Islamabad, CIIT has seven other fully functional campuses in Abbottabad, Attock, Lahore, Sahiwal, Vehari and Wah, as well as a Virtual Campus.



Mission

The Institute's mission is three-fold:

- i) **Research and Discovery:** Generate and preserve knowledge, understanding and creativity by instigating enquiry, conducting high-quality research and promoting scholarship, that would benefit students, scholars and communities across the country, the Muslim Ummah and the World, at large.
- ii) **Teaching and Learning:** Share the knowledge, understanding and creativity by providing a broad range of educational programmes among a diverse community of learners and teachers and prepare professional, graduate and undergraduate students, as well as non-degree seeking students interested in continuing education and lifelong learning for active roles in competitive and culturally diverse environments.
- iii) **Outreach and Public Service:** Extend, apply and exchange knowledge between the Institute and the society by applying scholarly expertise to intellectual, social and technological problems; helping organizations and individuals respond to their changing environments; and making the knowledge and resources created and preserved at the Institute accessible to the citizens. Using the resources of its multiple campuses in an integrated fashion, the Institute vies to



strengthen the services to the state through the education of a modern workforce, research and development, technology commercialization and partnership with business enterprises, government and relevant stakeholders of the community.

Areas of Specialization

CIIT offers 97 under-graduate and graduate degree programmes in the following main areas: Bioinformatics; Biosciences; Business Administration; Chemical Engineering; Power Engineering; Computer Engineering; Computer Science; Software Engineering; Economics; Humanities; Architecture; Pharmacy; Electrical Engineering; Electronics; Environmental Sciences; Earth Sciences; Pharmacy; Chemistry; Development Studies; English; Psychology; Health Informatics; Mathematics; Nanotechnology; Climatology; Physics; Meteorology; and Telecommunication and Networking.

Faculty and Students

CIIT has a teaching faculty of more than 3,173, including 567 faculty members who are undergoing advanced studies/ training leading to MS, Ph.D. degrees and post-doctoral research in various reputed universities of the developed countries. Currently, 1,088 faculty members and academic managers holding Ph.D. degrees are serving at CIIT, while the remaining have MS/M.Phil degrees. Over the year, CIIT has proudly produced 37,121 graduates, including 151 Ph.Ds since its inception and, at present, more than 37,000 students are enrolled with it under various programmes.

Achievements

During 2014-2016, CIIT was ranked among top 250 universities of Asia by QS Asian University Rankings. Higher Education Commission ranked CIIT at number 03 in the General Category and at number 06 among overall universities in 2016, and at number 01 in Computer Science and Information Technology in 2012 besides being ranked at number 02 in research publications in 2015. In 2013, CIIT received the prestigious 3-Stars Rating by QS. In 2015, CIIT was at number 301 in 301-400 QS World University Rankings by Subject Mathematics and among 401-450 in the field of Computer Science and Information Systems during 2016. CIIT also won the 1st



Federation of Pakistan Chambers of Commerce and Industry (FPCCI) Achievement Award for its outstanding services in the category of Education and Training. Besides, CIIT is also ranked at number 2 in Information Technology University's Quality Research Ranking 2016 of over 200 universities. It is also ranked at number 2 in university ranking in Pakistan and No. 967 in World University Ranking 2015/16 by Middle East Technical University Turkey in University Ranking Academic Performance. CIIT is also ranked at number 1 among top 10 Pakistani universities according to nature index in 2016.

Further, CIIT has achieved a singular honor of having produced more than 1,300 Impact Factor research publications in the country in a single year which makes it the number one institution of Pakistan to have ever crossed this milestone. CIIT also offers scholarships to students from COMSATS' Member Countries for studies at its various campuses.

Research and Development

A landmark to streamline and manage research at institutional level was achieved by establishing Office of Research, Innovation & Commercialization (ORIC) under the Dean of Research. With the establishment of ORIC, the number of projects to be funded by national and international donors is expected to register a sharp increase, and greater number of products developed by CIIT faculty to be put to commercialization.

CIIT has so far completed 48 development projects of worth Pak Rs. 8770.474 million, while two development projects worth Pak Rs. 1613.821 million funded by HEC are under way. The total development budget of CIIT for FY 2015-16 is Rs. 165.0 million. It is running more than 478 research projects of worth Rs.1137 million with the support of the HEC and other funding organizations.

International Linkages

Since its establishment in 1998, CIIT has been focusing its efforts on establishing professional linkages with reputed international universities and R&D institutions. These linkages are targeted at: advanced training of its faculty and students in cutting-edge technologies; joint research projects; faculty exchanges; as well as organization of professional meetings, seminars and workshops. As a result of such efforts, CIIT has already signed more than 310 Memoranda of Understanding (MoU) with well-established institutions across the globe. The hallmark of these linkages have been the signing of Memoranda of Agreement (MoAs) with University of Illinois at Urbana-Champaign (UIUC), USA; North Dakota State University (NDSU), USA; University of Genova, Italy; Xinjiang Normal University, China; Bayan Institute of Higher Education, Afghanistan; apart from several other





prestigious universities of Europe.

To further improve its human resource and establish linkages with the European universities, CIIT has developed strong partnership with Erasmus Mundus through its Mobility Programme in Asia and secured 35 slots, ranging from staff development to undergraduate, graduate, post-graduate, doctoral and post-doctoral studies, in various European universities during 2015. Similarly, for Mobilities under Mevlana Exchange Program, CIIT has entered into agreement with three leading universities of Turkey which include Duzce University, Dicle University, and Mugla Sitki Kocman University. Uptil now, around 23 faculty/students have availed their mobilities and another ten individuals would be going during 2016/17.

In order to directly benefit Organization of the Islamic Cooperation (OIC) and COMSATS' Member Countries, the Institute has announced 100 scholarships for students from COMSATS' member countries, 50 for students from OIC member countries, 50 for ISESCO, 50 for Azerbaijan, and 80 scholarships for the students from consortium of Afghan universities, Mauritius/Seychelles/ Madagascar, Bhutan, Maldives, Nepal and Sri Lanka, Myanmar, Kenya and Belarus. Further, Association of Commonwealth Countries (ACU) announced two scholarships tenable at CIIT Pakistan to the students of ACU member countries. In addition, an MoU has been signed with African Asian Rural Development Organization (AARDO). It is expected that foreign students from member countries of AARDO will soon join to study at CIIT.

The CIIT functions under the guidance of the Board of Governors (BoG) headed by the Executive Director, Commission on Science and Technology for Sustainable Development in the South (COMSATS)

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Syed Muhammad Junaid Zaidi, Rector CIIT, Pakistan

Dr. Syed Muhammad Junaid Zaidi is the founding Rector of the COMSATS Institute of Information Technology (CIIT). Dr. Zaidi has also served as Acting Executive Director of COMSATS for the period December 1998 to February 2000. Initially, started as a project of COMSATS in 1998, the CIIT was granted charter as a degree awarding institute by the Government of Pakistan in August 2000. Today, it is amongst the leading public sector higher education institutions in the country. CIIT has seven campuses spread across the country, over 37,000 students, around 3,200 faculty members, and offers over 97 graduate and undergraduate programmes. The phenomenal growth of CIIT bespeaks of the commitment and dedication of its founding Rector and his team.



Dr. Zaidi acquired a doctorate from the University of Birmingham, England (UK) in 1984. He possesses expertise in diverse disciplines, including Technology and Economic Policy Making, Operations Research, Industrial Information Networking, Project Planning and Management, Technology Commercialization and Utilization, Technology Forecasting, Technology Transfer, Build-Operate-Transfer mode of Project Financing, etc.

Dr. Zaidi's name is synonymous with the Government of Pakistan's success in the field of Information Technology (IT), through developing and training human resources. He has prepared and implemented plans for training of youth as well as diverse sections of the society in basic and advanced Information Technology concepts.

One of the high points of his career is the establishment of IT ventures and development of the IT Policy in Pakistan in the late nineties. Prior to that, he had been a key architect of similar policies in Asia-Pacific countries, including Malaysia – the front runner in the region.

Dr. Zaidi has been a driving force behind a number of initiatives in Higher Education, Science & Technology and Information Technology sectors in Pakistan, which include Virtual University, National Testing Service, Inter Islamic Network on Information Technology (INIT), ISESCO Center for Promotion of Scientific Research (ICPSR), Edward De Bono Foundation Pakistan, etc. He has completed a number of consulting assignments for multilateral institutions, Governments of a number of developing and developed countries, and has lectured extensively both in Pakistan and abroad, on matters relating to Science and Technology Policy and Human

Resource Development.

Dr. Zaidi has served in many high-profile positions at the United Nations (UN) and with the Government of Pakistan. He worked as an Advisor with the UN-ESCAP Asian and Pacific Centre for Transfer of Technology (APCTT), from 1987 to 1991. At APCTT, he contributed significantly to the enhancement of technology and information handling capabilities of developing countries of the region and also established a computerized online network of Asian and Pacific countries. During this period, Dr. Zaidi undertook several advisory missions as an IT specialist to Fiji, Ghana, Indonesia, Malaysia, Nepal, the Philippines, Sri Lanka, Tanzania, Thailand and Vietnam, and helped them establish their technology-transfer and industrial technology information systems.

Dr. Zaidi has conducted pioneering research and was successful in developing a special form of algebra and algorithm that ultimately led to the development of a high speed processor. He was a key member of the team working for the development of email on a commercially viable scale. After the successful completion of this research project, Dr. Zaidi established the first international online information sharing network in Pakistan in the mid eighties – much ahead of the rest of the countries in the region. He is considered an authority in the field of Networking.

Dr. Zaidi is highly regarded for his intellectual achievement and pragmatic approach to conceiving and implementing innovative ideas. The practicality with which Dr. Zaidi works and delivers results has earned him accolades both nationally and internationally. In appreciation of his services and in recognition thereof, he has been honoured with many national and international awards; the most notable among them is the prestigious civil award of Pakistan, Sitara-e-Imtiaz (Star of Distinction), conferred upon him by the President of the Islamic Republic of Pakistan in 2004.

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Participation in COMSATS' Activities

COMSATS Institute of Information Technology (CIIT), Pakistan

1. Date of Affiliation to COMSATS: 26th June 2008
2. Participation in COMSATS' Coordinating Council Meetings: CIIT-Pakistan has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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5 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
6 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
7 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
11 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
12 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
13 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
14 th Meeting	Dr. S.M. Junaid Zaidi, Rector CIIT
15 th Meeting	Prof. Dr. Sajjad Mohsin, Dean, Faculty of Information Sciences & Technology, CIIT
16 th Meeting	Dr. Haroon Rashid, Pro Rector CIIT Prof. Dr. Sajjad Mohsin, Dean, Faculty of Information Sciences & Technology, CIIT
17 th Meeting	Dr. Haroon Rashid, Pro Rector CIIT
18 th Meeting	Dr. Haroon Rashid, Pro Rector CIIT
19 th Meeting	Dr. S. M. Junaid Zaidi, Rector CIIT Dr. Haroon Rashid, Pro Rector CIIT

3. Hosting of COMSATS' Coordinating Council Meetings: CIIT-Pakistan hosted 19th Meeting of COMSATS' Coordinating Council, held on May 17-18, 2016, in Islamabad, Pakistan.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 42
5. Organization of COMSATS Activities: CIIT-Pakistan has organized following joint activities in collaboration with COMSATS:
 - i) International Symposium on Light and Life, October 14-16, 2015, Islamabad, Pakistan;
 - ii) National Seminar on "South-South Cooperation: Towards a Sustainable Future", September 14, 2015;
 - iii) International Spring School on Computational Materials and Education, May 25-29, 2015, Islamabad, Pakistan;

- iv) International Workshop on 'Applications of ICTs in Education, Healthcare, and Agriculture', December 15-16, 2014, Islamabad, Pakistan;
- v) 4th International Symposium on Biomedical materials, December 15-16, 2014, Islamabad, Pakistan;
- vi) International Conference on 'Asian Monsoon and Climate Change', January 20-21, 2014, Islamabad, Pakistan;
- vii) International Workshop on 'Doing Business with China', November 06-07, 2013, Islamabad, Pakistan;
- viii) 5th International Conference: Environmentally Sustainable Development (ESDev-2013), August 25-27, 2013, Abbottabad, Pakistan;
- ix) International Workshop on 'Nanotechnology Policy, Ethics, and Science', March 25-27, 2013, Islamabad, Pakistan;
- x) Global Forum on Islamic Finance, March 11-13, 2013, Lahore, Pakistan;
- xi) International Conference on 'Nanotechnology and Nano Ethics', December 01-03, 2011, Lahore, Islamabad;
- xii) International Workshop on 'Climate Change and Sustainable Management of Water Resources in the Asia-Pacific Region', November 22-24, 2011, Islamabad, Pakistan;
- xiii) Symposium on 'Quantum Information Processing', March 30, 2011, Islamabad, Pakistan; and
- xiv) 4th International Conference on 'Mathematical Models and Methods in Fluid Mechanics', July 07-09, 2008, Islamabad, Pakistan.

6. Participation in COMSATS' International Thematic Research Groups (ITRGs):

- i) CIIT is Lead Centre of Thematic Research Group on "Information and Communication Technologies (ICTs)". CIIT is executing a joint research project, entitled "Enabling ICT Applications using Long Distance Wi-Fi Networks" under the above mentioned ITRG. CIIT has organized 3 meetings of COMSATS ITRG and an international training Workshop on "Extreme Weather and Climate Events" (July 14-23, 2013, Beijing) under this ITRG.
- ii) CIIT-Pakistan is also participating in the following research projects of ITRGs:
 - "Characteristics and Mechanism of the Extreme Climate Events under the Climate Change Background" being executed by the ITRG on 'Climate Change and Environmental Protection', and led by International Center for Climate and Environment Sciences (ICCES), China; and
 - "Mathematical Modeling and Simulation of Air and Water Pollution: Effects and Remedies" being executed by the ITRG on 'Mathematical Modeling', and led by National Mathematical Centre (NMC).

7. Participation in COMSATS' Publications:

- i) COMSATS Newsletter: Profile of CIIT was published in COMSATS Newsletter Volume 1: Issue No 4 (Jul-Aug 2009) and profile of Rector CIIT

was published in COMSATS Newsletter Volume 4: Issue No 2 (Mar-Apr 2012).

- ii) COMSATS' Journal 'Science Vision': 17 Research articles received from CIIT-Pakistan have been published in COMSATS' Journal 'Science Vision' Vol.15, No.1; Vol.16, No.1&2; Vol.18, No.1&2; Vol.19, No.1&2; Vol.20, No.1; and Vol.20, No.2.

8. Any other Contribution:

- (i) COMSATS Science & Technology Park (CSTP): One of the key new initiatives approved by the Council in its 15th Meeting was the establishment of COMSATS Science and Technology Park (CSTP) at CIIT, Islamabad, Pakistan. In keeping with the Council's recommendation, CIIT has made efforts in this direction. The feasibility study for the CSTP has been completed and presented to the Ministry of Science and Technology, Government of Pakistan. In line with the Park's strategic objectives, a 'Business Incubation Center' (BIC) and 'Cubator1' have already been established at CIIT. Eight companies have graduated from the BIC and entered the open market and six are under various stages of incubation. The Cubator1 has 20 companies under incubation while six have already graduated.
- (ii) Scholarships offered at CIIT, Pakistan: COMSATS Institute of Information Technology (CIIT), Pakistan, has offered 100 graduate studies scholarships for students/researchers from COMSATS' Member Countries. Moreover, during the 18th meeting of COMSATS Coordinating Council, CIIT-Pakistan also offered five post-doctoral fellowships to researchers/scientists belonging to COMSATS Member States.
- (iii) Total number of scholarships provided upto 2015: 25

International Center for Chemical and Biological Sciences (ICCBS), Pakistan

Introduction

International Center for Chemical and Biological Sciences, Pakistan, is one of the best academic research institutions in chemical and biological sciences in the developing world. It is a designated Centre of Excellence of OIC, TWAS, UNCSTD, WAITRO, and COMSATS. The Center recently has also been recognized as UNESCO Category-II institution. The Center carries out research, training, product development and service delivery, as well as provides diagnostic, analytical and clinical testing services to a broad range of clients in the public and private sectors. ICCBS produced over 500 top-class PhDs in the field of chemical and biological sciences. This Center imparts highest quality research training to its students in frontier areas of science and technology that fulfils the need of quality manpower in science and technology, with an aim to prepare the graduates to serve the nation and humanity at large. ICCBS has established the first clinical trial and bioequivalence (BE) facility of the country.



ICCBS scientists reported the first complete genome sequence of Pakistan, thus making Pakistan the ninth nation and first Muslim state to have complete genome of its citizen sequenced. ICCBS endeavours to forge both North-South and South-South collaborations. Scientific collaboration and institutional linkages with top-class R&D institutions of the developing countries have been developed and further strengthened. The cooperation includes exchange of scientists, scholars, students and technicians, and work on collaborative research projects in key frontier areas of science and technology. The Center has signed memoranda of understanding with leading universities and research institutes in nearly 30 countries. ICCBS also hosts the Virtual Education Program of Pakistan (VEPP), which is a leading ICT-based education program in Pakistan and in the countries of the region.

Facilities at ICCBS

The facilities at ICCBS are at par with any top class academic institution in the



developed world. The Center has 14 superconducting nuclear magnetic resonance spectrometers, including more than 20 modern 800 MHz mass spectrometers; hyphenated instruments, including LC-MS/MS and GC-MS/MS, X-Ray diffractometers, next generation gene sequencers; animal houses facility (safety level II); patch clamp instrument; imaging facilities, including Atomic Force Microscope (AFM); pilot plant facilities; and clinical research center with 120 beds hospital and state-of-the-art bio-analytical facilities.



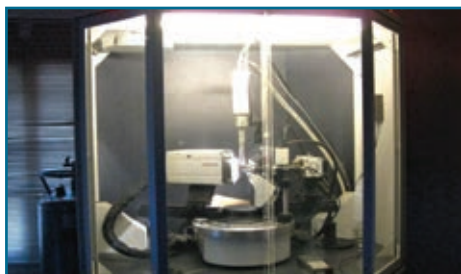
Research Productivity

The faculty of ICCBS institutions has won international recognition and published over 3,000 scientific papers in leading international journals and contributed over 200 books that were published by leading international publishers. ICCBS' research output, measured in terms of research articles and their impact factors in peer-reviewed international journals, and several patents, has helped ICCBS to gain visibility and recognition in the global scientific community. The center's main areas of studies are: organic chemistry, molecular medicine, herbal medicines, plant biotechnology, pharmacology, computational medicinal chemistry, bio-organic synthesis and natural product chemistry, electrochemical studies, petroleum and polymers, clinical biochemistry, neuropharmacology, and analytical chemistry.

The Center has largest doctoral program in the country producing about 50-60 world class PhDs every year in the field of chemical and biological sciences. The ICCBS' graduates have helped to transform Pakistan's pharmaceutical industry into a profitable domestic industry with strong potential for future growth, which has enhanced the reputation of ICCBS. The Center performs a critical role in transferring research in Pakistan from the laboratory to the marketplace. In recognition of its contributions, ICCBS has received the IDB Prize that reinforced the worldwide reputation of ICCBS for producing high-quality graduates.

International Collaboration

ICCBS has made collaborations with many institutions in developing countries for capacity-building and infrastructure development. It also has a joint initiative with the Centre for Science and Technology of the Non-aligned and other Developing Countries (NAM S&T Centre), headquartered in Delhi, India, to create opportunities for researchers in developing countries to work at ICCBS' laboratories. The center is a designated Center of Excellence of OIC, World Health Organization Center for Pesticide Analysis for Eastern Mediterranean Region, COMSATS' Centre of Excellence, COMSTECH Library Centre, TWAS Centre of Excellence, UNCSTD and UNESCO Centre of Excellence.



Research Laboratories

A number of institutions and laboratories are working, under the umbrella of ICCBS, which include HEJ Research Institute of Chemistry (HEJRIC); Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD); Professor Dr. Atta-ur-Rahman Laboratories (Formerly called Third World Center); Latif Ebrahim Jamal (LEJ) National Science Information Center; Biotechnology Wing; LEJ Nanotechnology Center; Industrial Analytical Center (IAC); Center for Bioequivalence Studies and Clinical Research; the Diagnostic Laboratory; the Biotechnology Laboratory; the Animal Houses Facility; and Jamil-ur-Rahman Center for Genome Research. These institutions contain some of the most sophisticated laboratories in the region. A number of goal-oriented projects are pursued by ICCBS, either independently for clients, or in collaboration with other similar institutions having research focus in chemistry of natural products, protein chemistry, organic synthesis, plant biotechnology, supra-molecular chemistry, pharmacology of herbal medicines, and stem-cell applications.

The industrial analytical center at the ICCBS has successfully marketed its services and products to Pakistan's industrial sector and, currently, has links with more than 350 industries in the country. Many international organizations and firms, including local field offices of international pharmaceutical companies, use services and

HEJRIC	Husein Ebrahim Jamal Research Institute of Chemistry
PCMD	Dr. Panjwani Center for Molecular Medicine and Drug Research
LEJNSC	Latif Ebrahim Jamal National Science Information Center
IAC	Industrial Analytical Center
BTP	Biotechnology Park
LEJNC	Latif Ebrahim Jamal Nanotechnology Center
Genome center	Jamil-ur-Rahman Center for Genome Research
CBSCR	Center for Bioequivalence Studies and Clinical Research
Diagnostic center	Diagnostic and Clinical research Facility
IRCTRD	International Research Center for Tropical and Regional Diseases
Animal House	Animal Resource Facility

products delivered by ICCBS. At its Diagnostic Center and Clinical Research Facility, ICCBS performs more than 400 routine and special tests, as well as 18 rare tests which are done using state-of-the-art equipment. A comprehensive library of molecular diversity has been established by ICCBS and managed by Molecular Bank of ICCBS, which can be utilized by researchers and commercial organizations in Pakistan and neighboring countries. The L.E.J. Center is catering to the information needs of over 5,000 (members) students and researchers of University of Karachi, and other institutions. The center remains operational until midnight. Approximately 400 scholars / students visit the center every day. The center has access to over 31,000 journals, and 40,000 e-books. The Center is also serving as the focal center for the activities of many organizations, such as the PABIC (Pakistan Biotechnology Center), PAS (Pakistan Academy of Sciences), SATLC (Systemic Approaches of Teaching and Learning in Chemistry), etc. Currently, VEPP (Virtual Education Project of Pakistan) is also managed and operated from this center. The LEJ National Information Center has established a knowledge hub for global access. The digital platform of the hub is comprised of a specially designed search meta-engine, which integrates thousands of on-line courses into easily accessible website, along with mentoring and assessment mechanisms.

Recently the establishment of Jamil-ur-Rahman Center for Genome Research (PCMD), ICCBS has launched a major initiative to carry out complete genome sequences of four major ethnic groups in Pakistan in the first phase. After publication of the first Pakistani genome, the researchers have recently completed the sequence of individual from two provinces of Pakistan (Punjab and Sindh), while the work on genome of the other two (KPK and Baluchistan) is underway.

International Conferences

The ICCBS institutions have organized several major international events. These include over 200 international conferences, symposia and workshops including the 19th IUPAC Symposium (1994); EURASIA Conference (2002); IBRO School (2006); ASOMPS (2013); Golden Jubilee event of 14th Asian Symposium on Medicinal Plants, Spices and Other Natural Products (ASOMPS-XIV) (2014); and IYCr South Asia Summit Meeting on Vistas in Structural Chemistry (2014). 5th



International Symposium-cum-Training Course on Molecular Medicine and Drug Research (2015). These events have not only contributed in developing productive research linkages with the foreign institutions, but have also gained recognition for the scientific work conducted at ICCBS and other Pakistani research institutions.

Future Plans

ICCBS and its component institutions aim to be the primary academic and research reference point in Pakistan and the region for industrial analytical services in the biological and chemical sciences. ICCBS is developing its capabilities to meet the needs of researchers from all developing countries and envisions adding several new components to its infrastructure, including a technology incubator, an industrial park, an industrial biotechnology park, a genome center, a food science institute, nano-chemistry institute, and a tropical disease research center.

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. Dr. M. Iqbal Choudhary, Director ICCBS, Pakistan

Dr. M. Iqbal Choudhary is a Professor of Organic Chemistry and Director at International Center for Chemical and Biological Sciences (H. E. J. Research Institute of Chemistry and Dr. Panjwani Center for Molecular Medicine and Drug Research). He is among the most prominent scientists of Pakistan, recognized for his original contributions in the fields of natural products and bio-organic chemistry. He has authored and edited 27 books, most of which have been published in USA and Europe. He is also the author of over 600 research papers and chapters published in the renowned international science journals of the West. The cumulative impact factor of his publication is over 1,000. This by far is the largest number of quality publications from any scientist in Pakistan of his age-group. He has been the most cited scientist of Pakistan in last five years with citations exceeding 3,400.



He is the Volume Editor of many international book series journals. He has served as a visiting faculty in many prestigious universities of the world including Cornell University (New York), Purdue University (Indiana), Pennsylvania State University (Pennsylvania), and the Scripps Institution of Oceanography (San Diego, California).

Dr. Choudhary has skillfully used his deep understanding of chemical principles and biological processes in the discovery of a large number of fascinating molecules with potential therapeutic applications. More specifically his research group at ICCBS has studied and discovered new inhibitors of clinically important enzymes, which can be used to stop the disease processes involved in the enzyme-related disorders. As a result, several new classes of lead molecules were made known to the world of science along with associated understanding of their mechanism of action.

The most notable contribution of Dr. Choudhary is in broad area of Bio-organic Chemistry where he used structural diversity of natural and synthetic compounds combined with biological targets to discover lead molecules with a potential to be developed as effective pharmaceutical agents. Some of the internationally recognized discoveries of his research group include the discovery of novel classes of acetylcholinesterase, ureases, and α -glucosidase inhibitors. The results of these studies have been published in over 150 research papers in top international journals and have also been patented internationally. His research group has also discovered the two most potent antiepileptic natural products (Iso-oxylitones A and

B) from a Pakistani medicinal plant *Delphinium denudatum*, which has attracted a major attention internationally. These compounds are now patented in USA and are in the process of pre-clinical studies.

His work has also resulted in a number of important scientific discoveries including the discovery of plant materials with pronounced antidiabetic, antileishmanial and cholesterol-lowering effects. Many of the structurally novel compounds, discovered by his research group were found to have interesting pharmacological profiles and are in different stages of development.

Prof. Choudhary has won several national and international awards. These include:

- Civil Award Hilal-i-Imtiaz by the President of Pakistan (2007);
- Civil Award Sitara-i-Imtiaz by the President of Pakistan (2001);
- Recipient of Civil Award Tamgha-e-Imtiaz by the President of Pakistan (1999);
- First Khwarizmi International Award and Prize from the President of Islamic Republic of Iran (2006);
- Economic Cooperation Organization (ECO) Award in Education by the President of Azerbaijan (2006);
- Doctor of Science (D.Sc.) University of Karachi (2005);
- Distinguished National Professor of the Higher Education Commission (2004);
- Prof. Abdus Salam (Nobel Laureate) Prize in Chemistry (1989);
- Prof. Raziuddin Siddiqui Gold Medal of Pakistan Academy of Sciences (1992);
- Third World Academy of Science Young Scientists Award (1994);
- National Book Foundation Prize (1995).

He is a member and fellow of many prestigious societies including:

- Fellow of the World Innovation Foundation (2006);
- Fellow of the Royal Society of Chemistry (2004);
- Fellow of the Third World Academy of Sciences (2003);
- Fellow of the Islamic Academy of Science (2003);
- Fellow of the Pakistan Academy of Sciences (2003);
- Fellow of the Chemical Society of Pakistan (2001);
- Senior Fulbright Fellow at the University of California at San Diego, USA (1999); and
- Fellow of the LEAD-International (Leadership for Environment and Development) sponsored by the Rockefeller Foundation, USA (1998).

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Participation in COMSATS' Activities

International Center for Chemical and Biological Sciences (ICCBS), Pakistan

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: ICCBS-Pakistan has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
3 rd Meeting	Prof. Dr. Atta-ur-Rehman, Director, HEJ Research Institute of Chemistry, Pakistan
4 th Meeting	Prof. M. Iqbal Choudhary, Director, HEJ Research Institute of Chemistry, Pakistan
5 th Meeting	Prof. M. Iqbal Choudhary, Director, HEJ Research Institute of Chemistry, Pakistan
6 th Meeting	Prof. M. Iqbal Choudhary, Director, HEJ Research Institute of Chemistry, Pakistan
7 th Meeting	Prof. M. Iqbal Choudhary, Director, HEJ Research Institute of Chemistry, Pakistan
9 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
10 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
11 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
12 th Meeting	Prof. Dr. Ahsana Dar, Sr. Professor ICCBS
15 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
16 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
17 th Meeting	Prof. Dr. M. Iqbal Choudhary, Director ICCBS
	Dr. Farzana Shaheen, Associate Professor, ICCBS
19 th Meeting	Dr. Farzana Shaheen, Professor, ICCBS

3. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 6
4. Organization of COMSATS Activities: ICCBS-Pakistan has organized following joint activities in collaboration with COMSATS:
 - i) 5th International Symposium-cum-Training Course on Molecular Medicine and Drug Research, January 12-15, 2015, Karachi, Pakistan;
 - ii) International Year of Crystallography (IYCr): South Asia Summit on 'Vistas in Structural Chemistry', April 28-30, 2014, Karachi, Pakistan;
 - iii) 14th Asian Symposium on Medicinal Plants, Spices, and other Natural Products, December 09-12, 2013, Karachi, Pakistan;
 - iv) 13th International Symposium on Natural Products Chemistry, September

22-25, 2012, Karachi, Pakistan;

- v) International Workshop on Sustainable use of Medicinal and Food Plants, September 15-17, 2000, Karachi, Pakistan; and
- vi) International workshop on the Use of Spectroscopic Techniques, February 15-21, 2000, Karachi, Pakistan.

5. Participation in COMSATS' International Thematic Research Groups (ITRGs): ICCBS is Lead Centre of Thematic Research Group on "Natural Product Sciences". ICCBS is executing a joint research project, entitled "Drug Discovery from Nature for Neglected Diseases" under the above mentioned ITRG and has organized 2 meetings of COMSATS ITRG.

ICCBS also provided short-term training (3 to 6 months) to three researchers from COMSATS Member Countries under its ITRG on Natural Product Sciences.

6. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of ICCBS was published in COMSATS Newsletter Volume 1: Issue No 6 (Nov-Dec 2009) and profile of Director ICCBS was published in COMSATS Newsletter Volume 3: Issue No 6 (Nov-Dec 2011).

7. Any other Contribution:

Scholarships offered at ICCBS, Pakistan: ICCBS has offered Ph.D scholarships for students/researchers from COMSATS' Member Countries.

Total number of scholarships provided: 3

Université Cheikh Anta Diop (UCAD), Senegal

Introduction

The University Cheikh Anta Diop (UCAD) is the main University of Senegal and the first university in Francophone Africa according to the Shanghai ranking. UCAD offers learning and research opportunities in a broad spectrum of disciplines in both initial and continuing training. In addition to the central administrative services of the Rectory, UCAD is composed of thirty higher research institutions, including 11 faculties, 19 institutes, and an Inter-State School of Veterinary Sciences and Medicine. With the effective implementation of the Licence - Master - Doctorate (LMD) reform to achieve international standards of training and research, UCAD has set up 7 doctoral schools and has signed contracts with the Senegalese Ministry of Higher Education and Research to improve quality and governance.



UCAD has a large number of cooperation agreements with universities and research centres from different countries in Africa, Europe, America and Asia, and is also developing many programmes as part of multilateral cooperation.

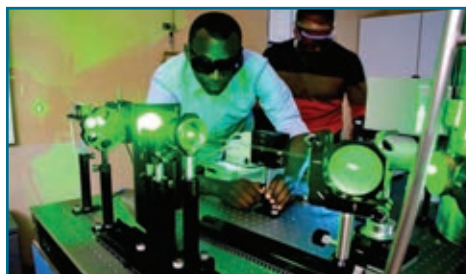
The University Cheikh Anta Diop is one of COMSATS' Centres of Excellence based on its various strengths, including those in the areas of:

- Renewable energy;
- Plant and microbial biotechnology; and
- Health.

Renewable Energy

The activities of training and research in the field of renewable energy are performed by:

- the Faculty of Science and Technology (FST) at its two laboratories: Laboratory of Semiconductors and Solar Energy (LASES); and Laboratory of Materials





Science (LSM);

- the Polytechnic Higher School (ESP) at its four laboratories: Laboratory of Applied Energetics (LEA); Laboratory of Renewable Energy (LER); International Centre for Training and Research on Solar Energy (CIFRES); and Laboratory of Physics of Atmosphere and Ocean; and
- the Centre for Studies and Research on Renewable Energy (CERER) at its four laboratories: Laboratory Photovoltaic Energy; Laboratory of Thermal Energy and Thermodynamics; Laboratory of Biomass and Domestic Fuels; and Laboratory of Wind Energy.

More than 50 academic professors and 150 graduate students work full time in the following renewable energy research areas:

- Conversion and energy storage (thermal, wind, solar);
- Thermal comfort in housing and energy efficiency;
- Modeling systems renewables and design of static converters;
- Monitoring and control of power systems;
- Electrochemical deposit n-type CdTe;
- Study of cells produced by electrochemical doping;
- Electrical properties of SnTe;
- Tabled CdTeSe and electrochemical characterization;
- Models for the spectral response of photo-electrochemical cells;
- Properties of condensed matter; and
- Behavior of functional materials.

Plant and Microbial Biotechnology

The activities of this unit of education and research are conducted in two laboratories: Laboratory of Plant Biotechnologies and Laboratory of Fungal Biotechnologies, of the Plant Biology Department of the Faculty of Science and Technology; and in a common laboratory of Microbiology of IRD/ISRA/UCAD.

Thirty-two professors, 15 technicians and 56 graduated students are working in this unit. Well-equipped technical platforms on tissue culture, phytopathology, molecular biology, and biochemistry help to cover the following research activities:

- Development of methods for micropropagation and in-vitro cloning;
- Ecophysiology of mycorrizal fungi and nitrogen fixing bacteria;

- Production and valorization of biofertilizers;
- Biological control;
- Integration of biotechnology in agriculture and forestry routes;
- Determination of the genetic variability of sources for a rational management of plant genetic resources;
- Introduction of genes of interest (resistance to pathogens) in tropical species;
- Study of the reproductive system and mode of transmission of genes in natural populations; and
- Development of axes of research for food security and sustainability.



Health

Main activities of this unit are achieved in the Bacteriology-Virology Laboratory of the hospital Aristide Le Dantec, Dakar. In addition to administration, finances and social services, the laboratory consists of 6 well-equipped technical platforms relating to bacteriology, molecular biology, immunology, virology, clinical trials and quality management and accreditation.

Bacteriology Unit: This Unit is the pioneer unit of the Bacteriology-Virology Laboratory and offers services on:

- Diagnosis of bacterial infections by processing the bacteriological samples of hospitalized and external patients;
- Sub-unit of mycobacteriology that performs tuberculosis diagnosis; and
- BL3 facility.



Virology Unit: This Unit is a reference laboratory for HIV infection.

The Molecular Biology Unit conducts research based on studies of cohorts, clinical trials and development of alternative diagnosis tools, and is in-charge of the virological monitoring of HIV infected patients. The unit was accredited by WHO for the surveillance of the HIV-1 drug resistances in 2009. It is also a training centre for students, trainees and other young researchers of the sub-region.

Clinical Trial Unit: This Unit conducts research activities on:

- HIV (HAART strategies evaluation);
- TB (the MVA85A vaccine in HIV+ subjects in collaboration with the universities of Oxford and Cape Town; and



- Hepatitis (PROLIFICA: Prevention of Liver Fibrosis and Cancer in Africa - WATCH = West African Treatment Cohort for Hepatitis).

The primary objective of this study is to demonstrate if the treatment of the hepatitis-B virus by nucleotide analogue reduces the risk of liver cancer in the populations of West Africa.

National/International Cooperation

UCAD has the following international/national associations/affiliations/initiatives:

- Member of COMSATS Network of S&T Centres of Excellence;
- Member of the National Committee to Fight Nosocomial Infections (CONALIN in French);
- African AIDS Research Network (Western and central zone) –AARN;
- African Society for Laboratory Medicine (ASLM);
- National Laboratory of Biosecurity;
- African Laboratory of Renewable Energy;
- International Master on Tropical Biotechnologies; and
- Joint laboratory on the adaptation plant and associated microorganisms to environmental stresses.

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. Ibrahima Thioub, Rector/President UCAD, Senegal

Prof. Ibrahima Thioub is the incumbent Rector /President of the Assembly of University Cheikh Anta Diop of Dakar (UCAD), Senegal, which has been a Centre of Excellence of COMSATS since May 2012.

Prof. Ibrahima Thioub did his Baccalaureate in Literature in 1978, and was awarded a Certificate of Specialization in History of Africa in 1981. He continued pursuing higher education and received a Masters degree in 1982 and a doctorate degree in 1989 from the University of Paris.



Professor of History at UCAD since 1990 and an Associate Member of the Nantes Institute for Advanced Study Foundation since 2009, Prof. Thioub specializes in slavery studies. He is regarded a specialist in the social and cultural history of Africa and was awarded honorary Doctorate degree by the University of Nantes, France, in March 2012.

Prof. Thioub has command over three languages, Wolof (native), French (working) and English (spoken), and teaches courses on the history and historiography of Senegal; history of Islam in Senegal (Xth-XXth centuries); and Slavery in Africa. He was a visiting professor at the EHESS and several universities in the United States and Europe. He was the Director of an international research program on alcohol and drug abuse in Asian countries (Nepal, India, Sri Lanka) and in many African countries (Gambia, Sierra Leone, South Africa). In 2008-2009 he was a resident researcher at Wissenschaftskolleg in Berlin.

Prof. Thioub's current research interests include studying slavery in daily life of Saint-Louis, Senegal (18th-19th centuries); and intellectual history of Francophone Africa and African identities. He has a critical eye on literature on African slavery and the Atlantic slave trade. Besides the employment of slaves in economic activities, he studied their role in social relations and their legal representation in private and public spaces. His study is a part of a historical perspective that takes into account the changes recorded over time in Saint-Louis.

He founded the African Centre for Research on Treaties and Slavery (CARTE) and serves as its Director. He has also been rendering services as:

- Executive Director of Centre for Research on Social Policies (CREPOS) (October 2009 - present); and
- Director Publication of the journal History & Heritage in Africa: Research and

Experiments (January 2008 - Present).

He has been contributing to different councils, boards and associations in the following capacities:

- Member of the Scientific Council of the University Cheikh Anta Diop (since 2007);
- Coordinator of the Cluster of Excellence Regional "Slavery and Treaties: Communities, Borders and Identities" (since July 2007);
- President of the West African Research Association (WARA) (since June 2004);
- Chairman of History Department, Cheikh Anta Diop University (2004-2008);
- Member of the Board of the Association of African Historians (AAH) (since 2001); and
- Editor of *Afrika Zamani*.

As an academic, he has many publications to his credit, mostly in French language. Translated titles and details of some of Prof. Thioub's publications are as follows:

- The Question of Chromatic Identity and Anti-colonial Movement in Africa, 1st International Congress of Black Writers and Artists, IEA Nantes, Scientific Events, Nantes 2012-2013 pp. 135-140.
- Stigmas and Memory of Slavery in West Africa: Skin Color and Blood as Social Fracture Lines, *New Global Studies*, Volume 6, Issue 3, 2012.
- Slavery in Saint-Louis in Senegal in the eighteenth-nineteenth century, *Jahrbuch 2008/2009*, Wissenschaftskolleg zu Berlin, 2010, pp. 334-356.
- The African Sarkozy. A Denial of History, Paris, Karthala, 2008, pp. 155-180.
- Heritage and historical sources in Africa (ed.), International Academic Union, UCAD, 2007, 179 p.
- Controlling Knowledge in Colonial Context: An Aspect of the French Cultural Policy in West Africa, *Listening (Again) to the African Past*. Smith College, Northampton (USA), October 18-26, 2003.
- Economic Liberalization in Senegal: Shifting Politics of Indigenous Business Interests, *African Studies Review*, 1998, 63-89 [co-author].

Contact details:

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Participation in COMSATS' Activities

Université Cheikh Anta Diop (UCAD), Senegal

1. Date of Affiliation to COMSATS: 25th May 2012
2. Participation in COMSATS' Coordinating Council Meetings: UCAD-Senegal has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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15 th Meeting	Prof. Aly Mbaye, Dean School of Economics, UCAD
17 th Meeting	Prof. Tahir Diop, In Charge Biotechnology and Mashroom Laboratories, UCAD
19 th Meeting	Prof. Tahir Diop, Head, Laboratory of Fungal Biotechnologies, Department of Plant Biology, Faculty of Sciences and Technology, UCAD

3. Participation in COMSATS International Conferences/Symposium/Workshops:
Number of Participants: 2
4. Participation in COMSATS' Publications:

COMSATS Newsletter: Profiles of former and present Rector University of Cheikh Anta Diop (UCAD), Senegal, were published in COMSATS Newsletter Volume 5: Issue No 5 (Sept-Oct 2013), and Volume 7: Issue No 5 (Sept-Oct 2015).

Industrial Technology Institute (ITI), Sri Lanka

Introduction

The Industrial Technology Institute (ITI) is a statutory board incorporated 1st April 1998, by virtue of the Science and Technology Act No. 11 of 1994 passed by the Parliament of Sri Lanka. ITI is the successor to the Ceylon Institute of Scientific and Industrial Research (CISIR), which was established in 1955. ITI operates as a market-driven partner to its client and stakeholders. Wholly owned by Sri Lankan government, ITI is a well recognized institute both locally and internationally. Over the last 60 years, ITI has rendered services to firms involved in businesses for local and foreign markets, national infrastructure development projects and overseas laboratories.



Objectives and Functions of ITI

The objectives and functions of the Institute are multifold and relate to:

1. Supporting the Industry:
 - a. Undertaking (on contract); testing, investigation and research for improving product quality, technical processes and methods used in industry, and for discovering new processes and methods to be used in industry;
 - b. Providing technical services and consultancies;
 - c. Engaging in activities connected with technology transfers, the adaptation of technologies and the development of new technologies;
2. Collecting, processing and disseminating useful technical information, in particular on “shelf technology” with a view to accelerating industrial development;
3. Conducting training of persons in areas of ITI's specialization;
4. Surveying & monitoring of environmental pollution and recommending remedial measures to mitigate effects of pollution;
5. Promoting technological development in cooperation with government



departments and institutions, universities, technical colleges, and other bodies in areas of demand-driven research.

In particular, ITI facilitates the development of technological processes in the areas of Materials Technology, Environment Management Technology, Food Technology, Herbal Technology and Biotechnology.



The Institute also aims to upgrade the departments of Food, Natural products, Biotechnology to a Center of Excellence with available resources. The School of Science and Technology of ITI aims to produce skilled manpower through training given by academically qualified staff.

ITI Quality Policy

The Management of ITI is unreservedly committed to comply with the ISO 17025 Quality Management System for Testing and Calibration services and ISO 9000 Quality Management System for the entire Institute, in keeping with the National Quality Policy, thus providing customers with services of the highest professional standards.

ITI labs and processes are accredited and conform to the Swedish Board of Accreditation (SWEDAC), Sri Lanka Accreditation Board for Conformity Assessments (SLAB), and ISO/IEC 17025.

The Research and Technology Division (R&D) and Information Services Centre (ISC) of ITI were the first research institute and library of the country to obtain ISO 9001:2008 Certification from the Sri Lanka Standard Institution (SLSI).

Technical Services

As Sri Lanka's premier analytical services centre, ITI leads the nation in chemical, microbiological and mechanical testing. With labs accredited both nationally (SLAB) and internationally (SWEDAC), ITI combines years of experience with cutting-edge technology in providing its wide array of testing and consultancy services.

Instrument maintenance is ITI's another area of expertise. The organization boasts the country's only accredited metrology laboratory that is equipped to offer calibration services.

As the leading technical research entity in the country, ITI also takes on the responsibility of monitoring sound and vibration levels across the island lest they should rise to unhealthy levels.

ITI provides technical services through its newly formed Chemical Residual Unit and the four primary laboratories:

- Chemical and Microbiological Laboratory;
- Electro Technology Laboratory;
- Industrial Metrology Laboratory; and
- Materials Laboratory.

Research and Development

ITI conducts client-sponsored research and development in the following areas:

- Food Technology related R&D includes work on new functional food products, and post-harvest technologies and protocols. Consultancies are also provided to modernize, upgrade and trouble-shoot issues for the food processing industry. Relevant research groups also conduct specialized training programmes for food industry personnel on food safety, regulations and new standard requirements.
- Herbal Technology services provided relate to the development of new herbal health care and pharmaceutical products and basic research on development of natural products from herbs, medicinal and aromatic plants and spices.
- Materials Technology Services of ITI offer multidisciplinary approach to facing technical challenges through laboratory and pilot-scale testing. The work includes projects, such as the development of new bio-degradable polymers, as well as research regarding oil and gas absorbing materials and self-cleaning coatings for ceramic products.
- Environmental Technology experienced team of scientists at ITI undertakes turn-key type development work on waste-water treatment, ventilation systems for industries, and environment impact studies.
- Engineering Services are performed by working closely with all sections of ITI; encompassing the design, fabrication and general workshop facilities, to promote and support the successful completion and implementation of the Institutes activities.
- Biotechnology Unit hosts research projects, testing services, a number of collaborations and educational training programmes on molecular biology and biotechnology for advancement of the sectors, such as agriculture, health, environment and industry in Sri Lanka.



Information Services

ITI's Information Services Centre has a collection of books, periodicals, journals, electronic resources, and standards and specifications of interest to entrepreneurs, professionals, academia and industry. This is one of the largest technical libraries in the country with the best overall collection of scientific and technical literature. This Centre also operates an inquiry service, and provides lending facilities through a membership scheme. The Members have online access to several electronic databases and resources through the ITI website. Current information on academic resources is periodically issued through the website.

Technology Transfer for SMEs

Industry and potential entrepreneurs are welcome to purchase the technologies for a range of innovative food and herbal products developed through R&D at ITI. Some of the major food product categories include: cereal-based products; fruit and vegetable products; rambutan, lime, tamarind, banana, jak, mushroom, soya, confectionery, coconut, cashew, fish, fish waste, meat, and dairy products. The herbal products include essential oils; herbal teas, medicines, cosmetics, toiletries; aroma chemicals; bio-fertilizers; aloe creams and gels; and betel products.

ITI also work with entrepreneurs to develop novel food, herbal, ceramic, clay or alternate materials for niche market with the technology being transferred exclusively to companies. ITI plays an active role in offering science and technology based solutions to improve the quality of life of the rural communities. It conducts numerous skill-building training programs within the communities to enhance the technical competence of prospective micro entrepreneurs, in collaboration with the Ministry of Science and Technology, Sri Lanka.



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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. G.A.S. Premakumara, Director/CEO ITI, Sri Lanka

Dr. Sirimal Premakumara Galbada Arachchige is a senior research scientist at COMSATS' Centre of Excellence in Sri Lanka, the Industrial Technology Institute (ITI), which was formerly known as Ceylon Institute of Scientific & Industrial Research (CISIR). Dr. Premakumara was appointed as the Director and Chief Executive Officer of this premier research institute of Sri Lanka by the former Sri Lankan Minister for Technology & Research, Hon. Ms. Pavithra Wanniarachchi.



Dr. Premakumara is known nationally and internationally for his research work in biologically active natural products, molecular medicine and drug research. His extensive research has brought a lot of fame to his Institute in the recent past especially due to his breakthrough KASPER technology for Kithul sector and the research conducted on medicinal properties of Kothalahimbutu, Binkohomba, Cinnamon and indigenous rice varieties.

Dr. Premakumara received his early education from the Royal College, Colombo, and graduated from the University of Colombo. He holds a Ph.D in Chemical Biology and Post-doctoral training in Nutrition Biochemistry & Biotechnology. He received his multidisciplinary training working in various international laboratories, including International Center for Chemical & Biological Sciences (ICCBS), Pakistan, which also is a Centre of Excellence of COMSATS; Marine Science Centre of Universiti Putra Malaysia (UPM), Malaysia; National Food Research Institute, Japan; and Proctor Maple Research Institute of University, Vermont, USA.

He is a recipient of many fellowships, including the prestigious JSPS Invitation Fellowship for Research by the Japanese Government. He received the 2006 Professor Chandrasena Memorial Award from the Institute of Chemistry for his exceptional research contribution to the field of organic chemistry, Pharmacology, Biochemistry and Bioactivity studies. He is also a recipient of many awards for his academic and research excellence that include Presidential Award, National S&T Award, and Talented Scientist Award from University of Tirupathi (India). He has over 20 years of experience in managing R&D laboratories, S&T personnel and R&D projects while working for many scientific institutions.

Dr. Premakumara also has established research collaborations with various prestigious institutes around the globe including the University of Texas at Arlington and University of Arkansas in USA, National Food Research Institute and National Institute for Animal Health in Japan and HEJ Research Institute of Chemistry and Dr.

Panjwani Centre for Molecular Medicine and Drug Research in Pakistan. He has over 150 research publications and several patents emanated from his research work.

As a contribution to capacity building for science & technology developments in the country, Dr. Premakumara has supervised over 20 MSc and 7 Ph.D students. He is also a member of various national & international undergraduate and postgraduate examination boards and reviewer of national and international scientific journals, books and monographs.

Dr. Premakumara is also a member of editorial board of International Journal of Herbal Medicine & Technology. He has held various positions in learned scientific bodies in the country and was the President of the Institute of Biology, Sri Lanka, in 2010.

Presently, Dr. Premakumara holds the Chair of Ethical Review Committee of the Institute of Biology. He is a member of various national committees and boards, including the National Research Council and National Committee on Women, whose appointments are directly made by the President of Sri Lanka.

Contact Details:

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Participation in COMSATS' Activities

Industrial Technology Institute (ITI), Sri Lanka

1. Date of Affiliation to COMSATS: 3rd May 2013
2. Participation in COMSATS' Coordinating Council Meetings: ITI-Sri Lanka has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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16 th Meeting	Prof. Vijaya Kumar, Chairman ITI
17 th Meeting	Dr. G. A. S. Premakumara, Director/CEO, ITI
18 th Meeting	Dr. Muditha Liyanagedara, Acting Director General, ITI Dr. G. A. S. Premakumara, Research Fellow, ITI Dr. Radhika Samarasekera, Additional Director General (Research & Development), ITI
19 th Meeting	Dr. G. A. S. Premakumara, Director General, ITI

3. Hosting of COMSATS' Coordinating Council Meetings: ITI-Sri Lanka hosted 18th Meeting of COMSATS' Coordinating Council, held on May 12-13, 2015, Colombo, Sri Lanka.
4. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 4
5. Organization of COMSATS Activities: ITI-Sri Lanka has organized following joint activity in collaboration with COMSATS:
 - International Symposium on Impacts of Atmospheric Extreme Events on Geo-surface in a Changing Climate, Colombo, Sri Lanka, May 14-15, 2015
6. Participation in COMSATS' International Thematic Research Groups (ITRGs): ITI-Sri Lanka is participating in the following research projects of ITRGs:
 - "Characteristics and Mechanism of the Extreme Climate Events under the Climate Change Background" being executed by the ITRG on 'Climate Change and Environmental Protection', and led by International Center for Climate and Environment Sciences (ICCES), China. The 4th Meeting of COMSATS' International Thematic Research Group on 'Climate Change and Environmental Protection' was hosted by the Industrial Technology Institute (ITI), held on May 16, 2015;
 - "Biotechnological Approaches to Improve some Wheat Lines Productivity under Biotic and Abiotic Stresses" being executed by ITRG on 'Agriculture,

food security, and biotechnology”, and led by National Research Centre (NRC), Egypt; and

- “Mathematical Modeling and Simulation of Air and Water Pollution: Effects and Remedies” being executed by ITRG on ‘Mathematical modeling’, and led by National Mathematical Centre (NMC), Nigeria.

7. Participation in COMSATS’ Publications:

COMSATS Newsletter: Profile of Director/CEO ITI was published in COMSATS’ Newsletter Volume 5: Issue No 6 (Nov-Dec 2013).

Industrial Research and Consultancy Centre (IRCC), Sudan

Introduction

Industrial Research and Consultancy Centre (IRCC), Sudan, was established in 1965 with the assistance of the United Nations Industrial Development Organization (UNIDO). The Centre is affiliated with the Ministry of Industry, Government of Sudan.



Mandate

IRCC has a mandate to undertake industrial research and consultancy services and disseminate findings that can have a positive impact on national industrial development. IRCC performs its functions by implementing Capacity-Building activity, mobilizing high-caliber professionals, modernization of the centre's infrastructure in line with the demands and expectations of industry, as well as enhancing internal collaboration and networking.

IRCC Services

The scope of services provided by IRCC includes:

- Research & Development;
- Consultancy;
- Quality Assurance; and
- Training.

Research Projects

The Centre undertakes projects on the following lines:

- Innovation in Agro-industries;
- Competitiveness of Sudanese Industries;
- Renewable and Sustainable Resources;
- Indigenous Knowledge & Rural Industries;



- Entrepreneurial Development;
- Improving efficiency of Industrial Process; and
- Modern science application.

Facilities

The facilities at IRCC include:

Two workshops rehabilitated pilot plants, 8 well equipped laboratories, fully equipped & integrated Tannery, a Training Centre, Conference Centre, Advanced Industrial Information Centre, and a consultancy house.

Rehabilitation Activities

Rehabilitation activities at IRCC include:

- Rehabilitation of the labs to match the calibration and accreditation prerequisite (second phase) SDG1,000,000
- Rehabilitated pilot plants (SDG2,000,000)
- Project for Training Centre (SDG1,000,000);
- Infrastructure rehabilitation for Leather Technology Centre;
- Establishment of mining & building material Lab (in River Nile State).

Education and Capacity-Building

IRCC is a member of the Federal Union of Sudan Academy of Sciences (SAS), which is the Council of industrial technologies and engineering research providing Masters and Ph.D. degrees in programmes such as cooling and conditioning technologies, engineering management and mining & underground water.

IRCC continues to support the development of skills through the provision of the following:

a. Capacity-building services in following disciplines among others:

- Food industry and Quality Assurance;
- Chemical Industry;
- Engineering Industry;
- Leather Goods Design and Manufacturing; and
- Feasibility Studies and Project evaluation.





b. Industry related awareness:

- Organization of Seminars and workshop;
- Print and online publications (Refereed journal & interactive website); and
- Industrial Directory.

Collaborations

IRCC has over the years developed strong linkages, and works in collaboration with several national, regional and international organizations and agencies. At the international level, linkages have been established with UNIDO, UNESCO, ISESCO and WAITRO, and at regional level, the Institute works in partnership with AIDMO, COMSATS, COMSTECH, and FASRC.

IRCC has signed Memoranda of Understanding (MOU) with local universities, including the Sudan University of Science and Technology. These MoU establish a framework of partnership between IRCC and the other parties. MOU have also been signed with the Sudanese Federation of Businessmen.

Some of the areas of cooperation with partner organizations include, joint research, training, exchange of information, sharing of research facilities and sharing of professional expertise.

Achievements

- IRCC has successfully set up soya bean processing pilot plan. In collaboration with the United Nations Industrial Development Organization (UNIDO) and the Government of Japan, IRCC has established and initiated operations of soya bean processing pilot plants at its premises. Twenty persons have been trained to promote the use of soya bean as food additive, and distribute soya enriched meals to local university hostels to promote its consumption.
- Setting up of Cleaner Production Centre;
- Recycling of Rag Paper;
- Extraction of Eucalyptus oil: 30 equipments have been distributed to house hold in Kenana Area to facilitate the extraction at household level;

- Completion of UNIDO sponsored demonstration project for leather sector

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Widad H.A. Halim Hassan, Director General, IRCC, Sudan

Dr. Widad Hassan is the Director General of Industrial Research and Consultancy Centre (IRCC), Sudan, since July 2014. IRCC was inducted into COMSATS Network of International S&T Centres of Excellence in 2008.

Dr. Widad attained her higher education from University of Khartoum, Sudan. In 1985, she did her B.Sc. in Chemistry from the University's Faculty of Education. In 1992, she completed her Master level studies in Biochemistry and Food Technology from the Faculty of Agriculture. Later in 2006, she was awarded a Ph.D in the same discipline from the University of Khartoum.



She has served academia in various positions; at the Department of Biochemistry, Faculty of Science, Islamic University, as a visiting lecturer (1995-1998), and at IRCC, earlier as Researcher (1998-2006) and Assistant Professor, and now as Associate Professor. She has also served as the Registrar of the Coordination Council for Engineering Research and Industrial Technology at the Sudan Academy of Sciences (SAS) from December 2011 to July 2014, and subsequently as Chairperson of the Council and Director General IRCC.

Dr. Widad has research interests in food technology, food fortification, and malnutrition related rehabilitation. Her on-going research projects include: ready-to-use food from local material designed for nutritional rehabilitation of malnourished children; food-to-food fortification for combating malnutrition; enhancement of bread using sour-dough; and combating malnutrition in school-going children using high-energy biscuits made from locally available ingredients. She has also participated in a joint international collaborative research project with Prof. Won Mukhtar on 'Ethanol Production from Sorghum Straw' at the Universiti Kebangsaan Malaysia (UKM), Malaysia. As an academician, she has also been supervising post-graduate students.

She has broad experience in Integrated Hazardous Waste Management and Sustainable Industrial Resources Management, and has prepared several feasibility studies for the national industrial sector of Sudan and United Nations Industrial Development Organization (UNIDO).

She has the distinction of launching the initiative for the establishment of National Cleaner Production Center. Dr. Widad provided leadership for the 'Capacity-Building Programme for Nanotechnology' and also served as a member of the

'Preparatory Committee for the Establishment of the Sudanese Nanotechnology Network'. In addition, she has been affiliated with the Ministry of Health, Government of Sudan, as a consultant for 'Food Fortification and Supplementation, Malnutrition and School Feeding Programme'.

She has organized and presented at several regional and international workshops/conferences, and has two international publications to her credit.

Dr. Widad has been a member of several scientific forums including: the Research Council of IRCC; Scientific Committee of the Coordination Council for Engineering, Research & Industrial Technology, SAS; and Central Examination Committee of SAS. She is also a Focal point of Scientific Industry Partnership for Sayga Investment Company, Sudan.

She has also been serving as a member to the Joint Technical Sub-committee for Food Fortification Programme; the Joint Technical Sub-committee for Preparing and Writing National Nutrition Policy Brief 1 and 2; and the Technical Higher Council of the Nationalization of the Engineering Industry.

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Participation in COMSATS' Activities

Industrial Research and Consultancy Centre (IRCC), Sudan

1. Date of Affiliation to COMSATS: 26th June 2008
2. Participation in COMSATS' Coordinating Council Meetings: IRCC-Sudan has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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10 th Meeting	Dr. Ahmed Obeid Hassan, Director General IRCC
11 th Meeting	Dr. Ahmed Obeid Hassan, Director General IRCC
12 th Meeting	Dr. Ahmed Obeid Hassan, Director General IRCC
13 th Meeting	Dr. Ahmed Obeid Hassan, Director General IRCC
14 th Meeting	Dr. Ahmed Obeid Hassan, Director General IRCC
15 th Meeting	Dr. Azhari Mohamed Elbadawi, Director General IRCC
16 th Meeting	Dr. Azhari Mohamed Elbadawi, Director General IRCC
18 th Meeting	Dr. Widad Hassan Abdulhalium, Director General IRCC
19 th Meeting	Dr. Widad Hassan Abdel Halim Hassan, Director General, IRCC

3. Participation in COMSATS International Conferences/Symposium/Workshops: Number of Participants: 18
4. Organization of COMSATS Activities: IRCC-Sudan has organized following joint activities in collaboration with COMSATS:
 - National Training workshop on "Repair and Maintenance of Scientific Engineering Equipment in Universities, Research Institutes and Small Scale Industries", August 18-22, 2013, Khartoum, Sudan;
 - International Conference on "Diffusion of ICTs in Academia: Learning in the Digital Age in Islamic Countries", October 4-5, 2010, Khartoum, Sudan;
 - Regional Training Workshop on "Applications of Predictive Maintenance Methods to General Industry", November 3 - 7, 2007, Khartoum, Sudan;
 - Training workshop on "Repair and Maintenance of Electronic, Scientific Laboratory and Medical Equipment", September 25 - October 5, 2005, Khartoum, Sudan; and
 - Training Workshop on Providing Theoretical and Practical Training for Instrument Repair, November 2004, Khartoum, Sudan.
5. Research Collaborations with Network Members: To establish the collaboration between NRC-Egypt and Industrial Research Consultancy Centre (IRCC), Sudan, two-member delegation headed by the Director General IRCC visited

the National Research Centre, Egypt, on June 22-27, 2013.

6. Participation in COMSATS' International Thematic Research Groups (ITRGs): IRCC-Sudan is participating in the following research projects of ITRGs:

- "Enabling ICT Applications using Long Distance Wi-Fi Networks" being executed by ITRG on 'Information and Communication Technologies' and led by COMSATS Institute of Information Technology (CIIT), Pakistan;
- "Drug Discovery from Nature for Neglected Diseases" being undertaken under ITRG on 'Natural Products Sciences', and led by International Center for Chemical and Biological Sciences (ICCBS), Pakistan; and
- "Biotechnological Approaches to Improve some Wheat Lines Productivity under Biotic and Abiotic Stresses" being executed by ITRG on "Agriculture, Food Security, and Biotechnology", and led by National Research Centre (NRC), Egypt.

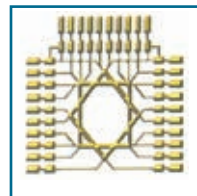
7. Participation in COMSATS' Publications:

- i) COMSATS Newsletter: Profile of IRCC was published in COMSATS Newsletter Volume 1: Issue No 1 (Jan-Feb 2009) and profile of Director-General of IRCC was published in COMSATS Newsletter Volume 5: Issue No 4 (Jul-Aug 2013).
- ii) COMSATS' Journal 'Science Vision': Research article received from IRCC-Sudan has been published in COMSATS' Journal 'Science Vision' Vol.16, No.1&2.

Higher Institute of Applied Sciences and Technology (HIAST), Syria

Introduction

The Higher Institute of Applied Sciences and Technology (HIAST), Damascus, Syria, was established in 1983. The Institute aims to develop human resource that is appropriately equipped to conduct scientific and technological research in all fields of applied science and technology so that it can actively contribute to the scientific and economic progress of Syria. HIAST offers specialized education, e.g. License in Engineering, Diploma, as well as Masters and Doctorate degrees, to prepare a specialized cadre of human resource in the field of engineering. The training and educational services provided by HIAST are need-oriented and planned to serve various sections of academia and industry of the country. The Institute coordinates and conducts its services in collaboration with several public and private-sector organizations of Syria. HIAST has a broad focus and executes joint projects at regional and international levels, to enable technology transfer and experience sharing.



Research and Development

The research and development activities at HIAST are aimed at: contributing to the development of technological environment, both locally and nationally; improving the knowledge and abilities of researchers and teaching staff and keeping them abreast of the scientific and technological developments taking place around the world; maintaining the highest levels of scientific excellence and extending its benefits to others; and encouraging, facilitating and promoting the local industry by introducing and equipping them with modern techniques, tools and skill-sets. The Institute has more than 104 professors, 132 Engineers, 90 technicians, 190 administrative and support staff working at the departments of Electromechanic Systems; Communications; Mathematics; Informatics; Physics; and Electronic Systems. Every department carries out the research activities through specialized work-teams, comprising researchers, engineers and technicians each to conduct applied research. These activities are classified into:





Projects of Engineering Development: Some of the engineering projects for the public establishments and the private-sector companies are focused at: designing software for managing administrative and financial matters, as well as for decision-support systems; setting up information networks, and improving educational laboratory equipment in various fields.

Engineering Research: Engineering projects of HIAST have a higher scientific and research scope. These are developed, initiated and financed by HIAST and, at times, undertaken with the assistance and cooperation from foreign partners, such as European Union. Some of the projects under this category include projects on: the computer processing of Arabic; renewable energy; sensors and measurement devices; and various substances, compounds and materials with special properties.

Implementation of R&D Projects

HIAST creates linkages with academic and scientific research establishments within Syria and abroad by participating in local and international symposia and forums. HIAST maintains close working relations with the local industrial enterprises in order to effectively facilitate them in their development. The implementation of such projects is kept under supervision for the whole project-life. In case of short- and long-term engineering research projects, the work-teams regularly prepare interim reports on the accomplished task, consequences and hurdles. Besides, regular lectures and seminars are held to discuss the aims and appraise the outcomes.

Scientific Facilities

Research Laboratories: The organizational structure of HIAST allows the establishment of independent laboratories specialized in technological research and development in specific areas. At present, there are 34 such laboratories. A dedicated team of professionals work in these labs that further contain complementary sub-labs.

Environmental-studies Laboratory: HIAST has an environmental studies laboratory that is considered one of the pioneering laboratories in Syria in the field. A team of researchers, specialists and technicians specialized in the domain of environmental studies and pollution is deputed at this laboratory. This laboratory works in line with Environmental Studies Centre, the Syrian Ministry of Environment and the Ministry



of Local Administration Housing and other institutions in Syria. Periodic environment surveys/studies at specific sites in Syria are conducted in this laboratory in response to some demands and contracts signed with different Syrian organizations. Moreover, the lab undertakes special research assignments and conducts technical studies to facilitate the enforcement of environmental code in Syria. Some of the functions of this lab include measuring the concentration of air and water pollutants for the treatment of water and waste disposal; measuring pollutants in the workplace and industrial emissions; and estimating the environmental impact and the danger imposed by the industrial projects.

Scientific Cooperation

- HIAST develops and maintains its scientific relations with international academic institutions to enrich the experience of its faculty members by enabling their participation in the joint projects of common interest. Activities of HIAST in terms of scientific cooperation comprise: participating in collaborative projects having international sponsorship; publishing project results and studies and implementing projects that reflect on education sector in Syria by winning grants from donor agencies, such as UNESCO, UN-ESCWA and UNDP.
- The Institute takes part in several national and international events and plays an important role in regularly organizing and sponsoring events, such as Arab School for Science and Technology, jointly sponsored by HIAST and other Arab institutions; Sham Informatics Conference; Palmyra School of Physics; International Conference for Communications Technologies and Applications; and Science Week, held annually by the Ministry of Higher Education, Syria.
- HIAST has signed a number of protocols and agreements with several national and international academic institutions.

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Profile of Head of COMSATS' S&T Centre of Excellence

Dr. Maher Suleiman, Director, HIAST, Syria

Dr. Maher Suleiman is the Director of the Higher Institute for Applied Sciences and Technology (HIAST) which is an educational institution founded in 1983 at Damascus, Syria.



Dr. Suleiman did his undergraduate studies at HIAST and received an Engineering Diploma in Informatics in 1991. He then proceeded to France where he pursued his postgraduate studies at the University of Montpellier-II. There, he received an advanced master degree (DEA), followed by a Ph.D. in Distributed Systems in 1998. He returned to Syria in the same year and started his academic career as a lecturer and researcher at HIAST. During his affiliation with HIAST, he has served the Institute in different scientific and academic positions, including: Chief of System and Computer Networks laboratory (2005); Vice Director for Scientific and Research Affairs (2008), and Head of Informatics Department (2009). Between 2010 and 2013, he was appointed as the Director General of National Agency for Network Services (NANS), which is a governmental agency under Ministry of Communication and Technology, mandated to making regulations, managing and operating the Syrian digital signature infrastructure (a public key infrastructure: PKI); the national Internet Top-Level Domains (TLDs); Computer Emergency Response Team Centre (CERT); and all other Internet related services. Having finished his 3-year term at NANS, he returned to HIAST as its Director (2014).

As an academician, Dr. Suleiman's work has been focused on subjects related to operating systems (OS) and networking. He has been a lecturer for undergraduate and postgraduate programmes at three institutions of Syria: HIAST; Damascus University; and Syrian Virtual University (SVU). He has also supervised theses of many Master level students and a Ph.D student. Working with SVU on part-time basis, he launched an engineering programme in informatics (ISE: Information System Engineering) in 2005 and was appointed as the Director of this programme for 8 years. Subsequently, he was appointed as the academic supervisor and Programme Director for the Doctorate programme at SVU.

As a network expert, Dr. Suleiman has performed many studies in the area of designing network infrastructures and data centres for enterprises and Internet service providers. These tasks were mainly performed for the benefit of governmental institutions. He has also provided many consultancies to the international organization, such as United Nations Development Programme (UNDP).

Dr. Suleiman has been actively involved in many important national and international programmes in various capacities, such as: Team Leader for HIAST for the SHERN Project (Syrian Higher Education Research Network); National Project Coordinator of EUMEDCONNECT project, which aims to connect the Mediterranean research networks with the European research networks; National Project Coordinator of EUMEDGRID project that is an EU Funded Project aiming to establish a pilot Grid infrastructure in the Mediterranean region supporting proof-of-concept (POC) for regional applications; National Team Leader of LINKSCEEM project, which aims at the establishment of a high performance computing ecosystem in the Eastern Mediterranean region by integrating and coordinating regional computational resources.

Dr. Suleiman has been a part of different national committees and boards, including: Syrian Telecom Regulatory Authority Task Force; Board of Directors of Syrian e-payment company; and Board of Directors of Syrian Post. He was also a Member Editorial Board of the International Journal of Informatics Researches, published by the Syrian Computer Society (SCS-IJIR).

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Participation in COMSATS' Activities

Higher Institute of Applied Sciences and Technology (HIAST), Syria

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: HIAST-Syria has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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3 rd Meeting	Mr. Zuheir Taha, Representative HIAST
5 th Meeting	Dr. D. Azzouz, Director HIAST
13 th Meeting	Dr. Wael Khansa, Director HIAST
19 th Meeting	Dr. Maher Suleiman, Director, HIAST

3. Participation in COMSATS International Conferences/Symposium/Workshops:
Number of Participants: 8
4. Organization of COMSATS Activities: HIAST has organized following joint activities in collaboration with COMSATS:
 - ISESCO-COMSATS Seminar on Bridging Gaps for Industrial Development: Interface between Academia, Policy Making and Industry, July 27-29, 2009, Damascus, Syria; and
 - A Training Workshop on Repair and maintenance of Scientific Instruments, December 19-23, 2005, Damascus, Syria
5. Participation in COMSATS' Publications:
 - i) COMSATS Newsletter: Profile of HIAST was published in COMSATS Newsletter Volume 2: Issue No 1 (Jan-Feb 2010) and Profile of Director HIAST was published in COMSATS Newsletter Volume 4: Issue No 1 (Jan-Feb 2014).
 - ii) COMSATS' Journal 'Science Vision': Research article received from HIAST-Syria has been published in COMSATS' Journal 'Science Vision' Vol.16, No.1&2.

Tanzania Industrial Research and Development Organization (TIRDO), Tanzania

Introduction

TIRDO is a parastatal organization which was established by an Act of parliament (No. 5 of 1979) and became operational in April 1979. Basically the organization was set up for the purpose of conducting industrial research and offer consultancy/technical services to industries.



Vision

High quality, environmentally friendly and demand-driven research institution with outputs resulting to competitive industry.

Mission

To conduct research, development and technical services on industrial processes and products, while utilizing local materials, in partnership with the industries

Functions

- To promote and carry out applied research designed to facilitate the evaluation, development and use of local materials in industrial processes.
- To conduct research in various aspects of local and foreign industrial techniques and technologies and evaluate their suitability for adaptation and alternative use in local industrial production.
- To advise the Government and firms engaged in industrial production on the adoption and adaptation of technologies in industrial production.
- To provide to the firms the advisory technical services related to the establishment of systems for the control and regulation of industrial processes so as to improve their performance and to avert or minimize the sources of industrial pollution.

Core Departments

Industrial Research (Director)

- Food and biotechnology division (Head)
- Industrial Chemistry and Agro-processing division (Head)
- Environment and Occupational Safety division (Head)





Engineering Development (Director)

- Materials Science and Technology division (Head)
- Textile and Leather division (Head)
- Energy division (Head)

ICT and Technology Transfer (Director)

- ICT division (Head)
- Instrumentation division (Head)
- Technology Transfer division (Head)

Research Programmes

The programmes include research in material science; information technology; food processing and bio-technology; fiber technology and leather; renewable energy; and agro-processing and industrial chemistry.

Priority Areas of Research

- Agro-processing Technologies (Value Addition);
- Gas and Petrochemical Technologies;
- Textile and leather Technologies;
- Coal, Iron and Steel Technologies;
- Natural and Medicinal products Technologies;
- Nanotechnologies (water and energy);
- Aquatic Ecosystems and Water Quality Technologies;
- Pollution Prevention and Control Technologies; and
- Integration of ICT in industrial processes.

Technical Services

- TIRDO Chemical laboratory offers a number of services for analyzing water, mineral rocks, food stuff, soil, industrial raw material, as well as quality control of finished products.
- TIRDO's Energy lab offers efficient



- energy systems services and also carrying out energy efficiency audit.
- The Materials laboratory offers a wide spectrum of non-destructive testing (NDT) as well as physical tests on engineering materials, such as metallographic, hardness, impact, bending, and tensile/compression tests.
 - The Environment laboratory offers advice to industries on management of resources for optimum production while ensuring minimum pollution.
 - The Food laboratory carries out physical, chemical and microbiological analyses of food, including meat, fish dairy products, cereals, fruits and vegetables, edible fats and legumes, honey and salt.
 - The ICT laboratory offers training in Cyber security and forensics.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. M.M. Angelo Mtambo, Director General TIRDO, Tanzania

Prof. Mkumbukwa Madundo A. Mtambo became the Director General of the Tanzania Industrial Research and Development Organization (TIRDO) in December 2013. Before joining TIRDO, Prof. Mtambo served the Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha-Tanzania as the Deputy Vice Chancellor responsible for Academics, Research and Innovations. Prof. Mtambo also served the Sokoine University of Agriculture from 1992 to 2013 in various positions, namely, Deputy Dean of Faculty of Veterinary Medicine, Head of Department of Veterinary Medicine & Public Health and Clinician In-Charge.



Earlier, Prof. Mtambo completed his Bachelor of Veterinary Medicine at the Sokoine University of Agriculture, Morogoro, Tanzania in 1987 and his Doctorate Degree in Veterinary Medicine (Ph.D) in 1992 at the University of Glasgow, United Kingdom. During his doctorate studies, Prof. Mtambo investigated the epidemiology of *Cryptosporidium*, a zoonotic parasite causing infections in animals and humans, in particular those with the Acquired Immunodeficiency Syndrome (AIDS). Prof. Mtambo has been involved in research activities on zoonotic water-borne protozoan parasites, other veterinary diseases of public health significance, wildlife diseases, poultry diseases, and medicinal plants. Prof. Mtambo has also been involved in providing consultancies on livestock-wildlife interactions, trans-boundary animal diseases, and poultry diseases.

Prof. Mtambo has served as the Principal Investigator for a number of research projects, including a regional project of Danish International Development Agency (DANIDA) and European Network for Religious Education in Europe through Conceptual Approaches (ENRECA), involving scientists from Denmark, Tanzania, Kenya, Uganda and Malawi, aimed at investigating the health and productivity of local chicken in East Africa. He led DANIDA sponsored two projects, 'Transformation of Smallholder Livestock Farming into Profitable Enterprises', and 'Challenges and Opportunities of Urban and Peri-urban Livestock Farming'. Prof. Mtambo has also been involved as a team lead in a project that developed a vaccine against Newcastle disease in chickens using indigenous virus isolate in Tanzania.

He is actively involved in research projects investigating on the efficacy of medicinal plants against various disease-causing microorganisms. These resulted in development of three Patents under Business Registrations and Licensing Agency (BRELA) in Tanzania: TZ/P/10/00274 (2011), TZ/P/10/00277 (2011) and TZ/P/10/00280 (2011).

As an academican, Prof. Mtambo has supervised and examined a number of Master and Ph.D. students at the Sokoine University of Agriculture; University of Dar-es-Salaam; University of Nairobi, Kenya; Makerere University, Uganda; and the Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania. He has also served as a visiting lecturer at the University of Zimbabwe, Zimbabwe, in 1995. Prof. Mtambo has published over 80 papers in peer reviewed journals and conference proceedings and reviewed a book on *Cryptosporidium* infection.

Contact details:

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Participation in COMSATS' Activities

Tanzania Industrial Research and Development Organization (TIRDO), Tanzania

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: TIRDO-Tanzania has participated in the following Meetings of COMSATS' Coordinating Council.

Council Meetings	Name of Delegates
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1 st Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
2 nd Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
3 rd Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
4 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
5 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
7 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
9 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
10 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
11 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
12 th Meeting	Dr. A.P. Nanyaro, Director-General TIRDO
13 th Meeting	Dr. A.P. Nanyaro, Director General TIRDO
17 th Meeting	Dr. Manege L. C., Director of Industrial Research, TIRDO
18 th Meeting	Prof. M.M. Angelo Mtambo, Director General, TIRDO
19 th Meeting	Dr. Lugano Wilson Mwansule, Director of Engineering Development, TIRDO

3. Participation in COMSATS International Conferences/Symposium/Workshops:
Number of Participants: 4
4. Research Collaborations with Network Members: To establish collaboration between TIRDO and TUBITAK MAM-Turkey, a three-member delegation from TIRDO, headed by the Director General, Prof. Mkumbukwa Mtambo, accompanied by two Directors (Dr. Manege and Dr. Lugano) paid a visit to TUBITAK MAM-Turkey from August 24 - 27, 2015. Based on the discussions on various issues of cooperation including coal technologies development, an MoU is being finalized between the two institutions which will show clearly the areas of cooperation and the responsibilities of each institution.
5. Participation in COMSATS' International Thematic Research Groups (ITRGs):
TIRDO-Tanzania is participating in the following research projects of ITRGs:
 - "Enabling ICT Applications using Long Distance Wi-Fi Networks" being executed by ITRG on 'Information and Communication Technologies' and

- led by COMSATS Institute of Information Technology (CIIT), Pakistan; and
- “Mathematical Modeling and Simulation of Air and Water Pollution: Effects and Remedies” being executed by ITRG on ‘Mathematical modeling’, and led by National Mathematical Centre (NMC), Nigeria.

6. Participation in COMSATS Publications:

- i) COMSATS Newsletter: Profile of TIRDO was published in COMSATS Newsletter Volume 2: Issue No 5 (Sep-Oct 2010) and profile of Director-General of TIRDO was published in COMSATS Newsletter Volume 6: Issue No 2 (Mar-Apr 2014). COMSATS published a report of TIRDO in its Annual Report for year 2012, and 2013.
- ii) COMSATS’ Journal ‘Science Vision’: Research articles received from TIRDO-Tanzania have been published in COMSATS’ Journal ‘Science Vision’ Vol.2, No.2; and Vol.2, No.4.

Water Research And Technologies Centre (CERTE), Tunisia

Introduction

The Center for Water Research and Technologies (CERTE) is a public institution, under the authority of the Tunisian Ministry of Higher Education and Scientific Research, with an administrative character which beneficiaries of the legal entity and financial autonomy. The Center is a part of the Borj-Cedria Technopark, specialized in Water and Environment. It is located 35 km South of Tunis City.



The main objective of CERTE is to carry out research and development activities; develop innovative technologies in water related fields; and contribute towards integrating research findings at policy level for socio-economic benefit.

Mission

The mission of the CERTE is to implement Tunisia's National Policy and Strategy on water resource management and to carry out related research projects and programmes. The Centre intends to contribute to the water sciences and technology development and to build partnership with industry and academia. It also intends to valorize the research results in the social-economic sector and to ensure transfer of the technological and scientific know-how. CERTE's mission is to keep up with technological innovations in the water related fields to support regional and international partnership and positioning. CERTE provides supervision and consultancy for Masters/Ph.D. thesis and engineering training in the water related fields.

Scientific Facilities

Research Laboratories: CERTE conducts research programmes related to National Water Strategy through its three main R&D laboratories:

Geo-Resources Laboratory: The Geo-resources Laboratory has a mission of conducting R&D programmes in the following fields: surface water, groundwater resources, climate change impact, reservoir geology, and





geophysics of deep aquifers, geostatic and geomatics engineering.

Wastewater Treatment Laboratory: The Laboratory of Wastewater Treatment conducts R&D programmes in the following fields: water treatment; reuse and recycling of urban water; reuse of industrial wastewaters; adapting and up-grading the wastewater treatment technologies; water pollution prevention and its environmental impact and human risk assessment; and local water management at the urban, rural and industrial levels.

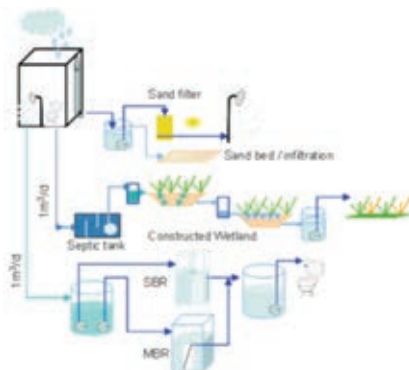
Natural Water Treatment Laboratory: The Laboratory of Natural Water Treatment has R&D programmes in the following fields: identification, characterization and resolving problems of scaling; mineralization of carbonates, iron, phosphate and nitrates in water; and distribution network of drinking water; and water desalination.

Pilot Plants: To support its comprehensive research activities, CERTE has built facilities of pilot plants and experimental fields:

SWM Pilot Plant: CERTE has a Technical Demonstration Centre (TDC) for Sustainable Water Management (SMW). The SWM model equipment, installed in the TDC, cover a range of measures from water-saving equipment to wastewater recycling. By making various configuration of treatment units (black, grey and rain water) and other equipment, intended to provide a design for comprehensive setting.

Rural Experimental Field (Chorfech village): The Chorfech village experimental field is used as a demonstration site for SWM solutions. The field consists of a series of three stages of constructed wetland field. The aim is to show that these solutions work under real conditions and ultimately allow further replication of the demonstrated techniques.

Municipal Wastewater Treatment Plant: The Municipal Wastewater Treatment Plant is a semi-industrial pilot plant (100 and 150 m³/d), including several pilot plants for: Wastewater Stabilization Ponds (30 m³/d, 500 m²); Trickling filter (30 m³/d); Biorotor (20 m³/d),



Infiltration-percolation (5 m³/d); and Disinfection unit. This pilot plant is connected to the municipal sewerage system.

Training and Services

With its partners, CERTE has organized several scientific workshops, seminars, and training sessions related to water in Tunisia, and Africa and the Mediterranean regions. CERTE has high scientific investigation and analytical capacity to support its research programmes, as well as to provide support to public and private-sector companies for:



- Capacity-building for water resource investigations (geophysics, geochemistry);
- Physical-chemical and microbiological characterization (Analysis of water, waste, and sediment);
- Analysis and treatment by membrane technologies for industrial water and desalination;
- Analysis and services for academic, economic and industrial institutions (SEM, RX, AFM, GCMS, HPLC, GIS and LCA);
- Wastewater treatment expertise, plant designs and diagnostics; and
- Pilot plants for innovative investigation and optimization studies.

International Cooperation

CERTE participates in several bilateral and multilateral European projects, such as those with:

- European Union (Austria, Belgium, France, Germany, Greece, Italy, Portugal, and Spain);
- Asian countries (Japan and Turkey); and
- Arab countries (Algeria, Egypt, Morocco, Jordan, and Palestine).



For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Prof. Dr. Ahmed Ghrabi, Director General, CERTE, Tunisia

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



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

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

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

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

- Microbiological Examination of Water Treated by Fluorescent Semiconductor Nano-crystals (Tunisian-French cooperation) [2014 to 2016];
- Capacity-building Programme on 'Water Integrity in the Middle East and North Africa' (MENA-WI) (Tunisian-Swedish Cooperation) [2014 to 2017];
- Integrated Action for Scientific and Institutional Strengthening of Treatment and

Reuse of Wastewater in Small Towns (Tunisian-Spanish cooperation) [January to December 2013];

- Fostering Partnerships for the Implementation of Best Available Technologies for Water Treatment & Management in the Mediterranean (EU-FP7) [September 2013 to August 2016];
- Mediterranean Science, Policy, Research & Innovation Gateway (MED-SPRING) (FP7- INCO.2012-1.3/Mediterranean Partner Countries) [2013 to 2017];
- Sustainable Domestic Water Use in Regions of the Mediterranean SWMED (European Union: ENPI Programme CBCMED) [2012 to 2015];
- Capacity-building for Reuse with Live Mediterranean Area (CB-WR-MED) [May 2010 to April 2013]; and
- Sustainable Concepts Towards a Zero Outflow Municipality, under Euro-Mediterranean Programme for Local Water Management: MEDA Water Programme [2003 to 2009];

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

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

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

Contact details:

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General Director of CERTE

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Participation in COMSATS' Activities

Water Research and Technologies Centre (CERTE), Tunisia

1. Date of Affiliation to COMSATS: 20th May 2014
2. Participation in COMSATS' Coordinating Council Meetings: CERTE-Tunisia has participated in the following Meeting of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
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17 th Meeting	Prof. Mohamed Ben Youssef, Director General CERTE Mr. Mohamed Ben Amor, Professor of Higher Education, CERTE
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19 th Meeting	Prof. Ahmed Ghrabi, Director General, CERTE
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3. Participation in COMSATS' Publications:

COMSATS Newsletter: Profile of Director-General of CERTE was published in COMSATS Newsletter Volume 6: Issue No 6 (Nov-Dec 2014).

TÜBİTAK Marmara Research Center (MAM), Turkey

Introduction

TÜBİTAK Marmara Research Center (MAM) has been at the forefront of science and technology development in Turkey. Established in 1972, TÜBİTAK MAM is now an internationally reputed S&T organization. As the largest research center in Turkey, TÜBİTAK MAM strives to achieve national development objectives by:



- Conducting researches on advanced and conventional technologies to improve the competitiveness of Turkish industry, and
- Identifying and solving technological problems, and ensuring the application of the developed technological solutions.

Located in the north of İzmit Bay in Gebze, TÜBİTAK MAM is situated on an area of more than 8,000 acres. TÜBİTAK MAM is a good example of campus-type research centers. It is located in the vicinity of the most developed industrial zones of Turkey. In addition to Marmara Research Center, the TÜBİTAK Gebze Campus harbors the Informatics and Information Security Research Center, the National Metrology Institute, the Turkish Institute of Industrial Management and “Marmara Teknokent (MARTEK) Co.”, which operates the Technological Free Zone (TEKSEB) and Technological Development Zone (TEKGEB). Thus, the campus provides various services (including training and infrastructure) in science and technology for Turkish industry.

The vision of TÜBİTAK MAM is to be ranked among the leading science and technology centers of the world in the field of applied research; and its mission is to contribute towards improving of the global competitiveness of Turkey based on science and technology.





Scientific Capacity

There are seven institutes of TÜBİTAK MAM:

- i) Institute of Chemical Technology
- ii) Earth & Marine Sciences Institute
- iii) Energy Institute
- iv) Environment & Cleaner Production Institute
- v) Food Institute
- vi) Genetic Engineering & Biotechnology Institute
- vii) Materials Institute

The focus and research areas of these seven institutes are as follows:

Institute of Chemical Technology

- Defense and Forensic Science
- Production Technologies
- Pharmaceutical and Medical Device Technologies
- Industrial Technical Support Services

Earth & Marine Sciences Institute

- Active Tectonics Research Technologies
- Advanced Geology Technologies
- Geophysical Imaging Technologies

Energy Institute

- Advanced Energy Technologies
- Power Electronics and Control Technologies
- Electrical Power Technologies
- Energy Storage and Electrochemical Energy Conversion Technologies
- Automotive Technologies



Environment & Cleaner Production Institute

- Water and Wastewater Management
- Marine and In-Land Waters
- Air Quality Management
- Solid and Hazardous Waste
- Clean Production

Food Institute

- Food Science and Technologies
- Nutrition and Functional Foods
- Food Microbiology and Biotechnology

Genetic Engineering & Biotechnology Institute

- Animal Biotechnology
- Medical Biotechnology
- Enzymes and Microbial Biotechnology
- Plant Biotechnology

Materials Institute

- Structural and Critical Metallic Materials
- Sensor Materials and Systems
- Industrial Technical Support Services

Technical Services

TÜBİTAK MAM is a multi-disciplinary high-technology institution employing distinguished scientists at sophisticated laboratories that are furnished with the most advanced equipment. TÜBİTAK MAM is always at the service of industrial entities, defense institutions, universities and other public institutions (e.g. local administrations, regional management boards, ministries, etc.).

TÜBİTAK MAM's activities can be classified as Industrial Projects (e.g. developing products and processes, reducing costs, increasing productivity, etc.) or as



Industrial Services (e.g. testing, analysis, measurement/monitoring, training and consultancy). When carrying out projects and providing industrial services for its stakeholders, TÜBİTAK MAM's most valued characteristics are customer-orientation and quality.

Facility Certificates

- National Secret Facility Security Clearance Certificate
- NATO Secret Facility Security Clearance Certificate
- Production Permit from the Ministry of National Defense
- ISO 9001-2008 Quality Management System Certificate
- ISO 14001-2004 Environmental Management System Certificate
- ISO 17025 Accreditation of Laboratory Services
- EFQM Excellence Award.

Approach to Projects

TÜBİTAK MAM contributes towards improving the quality of Turkey's high-tech product development through the technologies it creates and the know-how it provides. Some of the typical projects activities carried out by TÜBİTAK MAM are:

- Development of new knowledge for situations that cannot be resolved with readily available methods/technologies and, therefore, require the application of scientific principles and the development of specialized methods for testing and/or measurement/monitoring.
- Development of solutions for technological problems, improvement of existing technologies and technology transfer and/or adaptation, including the generation of useful tools, materials, methods, processes, systems and production techniques that result from basic and/or applied research projects.
- Training projects for increasing the efficiency, productivity and international competitiveness of customers, as well as training projects for improved management, by transferring the latest scientific and technical developments

- and experiences to customers.
- Consultancy projects involving the identification of feasible alternatives or the provision of infrastructure for solving technological problems and developing technological systems or methods.

Some Statistics

TÜBİTAK MAM, which has adopted a customer-oriented approach as a fundamental principle since the mid-1990s, has started receiving the fruits of its labor in the 2000s.

To sum up in figures, TÜBİTAK MAM:

- carries out an average of 200 projects per year;
- has more than 130 laboratories in which approximately 60.000 tests/analysis are carried out per year; and
- has more than 60 patents and this figure increases by roughly 10% per year.

TÜBİTAK MAM shares knowledge which it has accumulated over the years, as well as its advanced equipment and laboratory infrastructure with universities, science and technology institutions and industrial entities. TÜBİTAK MAM anticipates/assesses the needs and expectations of Turkish industry and plans future-oriented studies in order to meet these needs. The objective of TÜBİTAK MAM is to implement long-term research and development projects with the participation of all stakeholders and to contribute to the improvement of Turkey's competitive power.

For further details, please contact:

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Profile of Head of COMSATS' S&T Centre of Excellence

Assoc. Prof. Bahadır Tunaboğlu, President, TÜBİTAK MAM, Turkey

Dr. Bahadır Tunaboğlu is the incumbent President of TÜBİTAK Marmara Research Center (MAM), a leading multidisciplinary research institution working under the patronage of Scientific and Technological Research Council of Turkey (TÜBİTAK). MAM has been the accredited COMSATS' Centre of Excellence since October 1994.



Dr. Tunaboğlu did his B.S. in Metallurgical Engineering (1983-1988) from ODTÜ/Middle East Technical University, Ankara, and M.S. in Ceramic Engineering (1989-1991) from New York State College of Ceramics at Alfred University, USA. From 1991 to 1997, he continued his higher education and received his doctorate degree in Materials Science from the University of California, San Diego, USA.

Dr. Tunaboğlu started his professional career in 1988 at the Turkish Standards Institute, Ankara, as a Metallurgical Engineer. After over a year, he left for USA, where he worked at Alfred University (New York) and University of California (San Diego) as Research Assistant during the next eight years of his life (1989-1997). While working for Alfred University, he also upgraded his academic qualification to attain a Master's degree from the University's New York College of Ceramics. From 1997 to 2010, Dr. Tunaboğlu received great professional experience working for a number of U.S. companies, before returning to his home country, Turkey. During these thirteen years he worked as Materials Scientist at Cerprobe Corp and K&S Industries (1997-2000); Project Manager/R&D at Kulicke & Soffa Industries and Test Systems Manager at SV Probe Inc. (2000-2007); and later as R&D Director at SV Probe Inc. (2007-2010).

Since his return to Turkey in 2010, Dr. Tunaboğlu has been affiliated with Istanbul Şehir University as Associate Professor. His association with TÜBİTAK MAM started in 2012 when he took charge as the Acting Director of the Center's Materials Institute. In early 2014, Dr. Tunaboğlu took over as the President TÜBİTAK MAM.

Dr. Tunaboğlu remained focused throughout his academic and professional career on materials science. Accordingly, his research interests have been in New Materials Development; Semiconductor Technologies; Design and Modeling of Renewable Energy Systems; and Engineering Management.

He has worked with a number of national/international organizations for R&D projects, including: 'Thermal Management of Li-Polymer Battery Pack Modules for

Efficiency Improvement to be Used in Green Transportation' (a project of KORANET-EU); 'Development of photocatalytic, antibacterial and fire resistant nano-composite paint' (funded by Turkish Ministry of Science, Industry and Technology). The two R&D projects he is currently contributing to are: 'LED Lighting Technology Development'; and 'Development of Super-alloy Turbine Blades for Aerospace Applications'.

As an academican, he has supervised three M.S students, while four are currently benefiting from his scholastic and professional experience. Dr. Tunaboğlu has to his credit a number of publications in renowned journals and industrial magazines related to materials science. He made a number of technical presentations in international seminars and his papers have been published in different conference proceedings. As a researcher, he has 23 patents with U.S. Patent Office, while five patent applications are under process.

Dr. Tunaboğlu has been a part of several scientific societies and technical committees. Some of these include: Member of Organizing Committees for the 6th International Conference for Entrepreneurship, Innovation, and Regional Development (ICEIRD-2013), Istanbul; International Workshop on SSL-Solid State Lighting 2013, Istanbul; SOLAR TR 2014 Conference and Exhibition; and International Porous Materials Conference (2013), Izmir, Turkey. He has been Board Chairman of TÜBİTAK Marmara Research Center; Board Member of TÜBİTAK National Metrology Institute; Advisory Board Member of Karabük University (Iron & Steel Institute); Co-chair of Turkey-USA Materials Working Group; and Member of Turkish Nanotechnology Platform.

Dr. Tunaboğlu is a recipient of IEEE-CPMT Best Paper Award (2012); Most Inspirational Presentation Award (2010); and Intel Tool Operations, Outstanding Service and Support Award (2005 & 2006). For his scientific excellence and meritorious work, Dr. Tunaboğlu also won NATO Fellowship (1989-1992); US/Lawrence Livermore National Labs/IGPP Project (1992); and US DARPA Grant, Graduate Researcher (1993).

Contact Details:

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Participation in COMSATS' Activities

TÜBİTAK Marmara Research Center (MAM), Turkey

1. Date of Affiliation to COMSATS: 5th October 1994
2. Participation in COMSATS' Coordinating Council Meetings: MAM-Turkey has participated in the following Meetings of COMSATS' Coordinating Council:

Council Meetings	Name of Delegates
1 st Meeting	Dr. Omar Kaymakcalan, President MAM
5 th Meeting	Mr. Kamal Termiciler, Representative MAM
7 th Meeting	Prof. Dr. Naci Gorur, Representative MAM
9 th Meeting	Mr. Mehmet Demirel, Vice President MAM
11 th Meeting	Mr. Mehmet Demirel, Vice President MAM
13 th Meeting	Mr. Mehmet Demirel, Vice President MAM
14 th Meeting	Mr. Mehmet Demirel, Vice President, Strategic Planning & Business, MAM
15 th Meeting	Prof. Dr. İbrahim Dinçer, Acting President MAM
16 th Meeting	Assoc. Prof. Dr. Fehmi Akgün, Chief Senior Researcher, Energy Institute, MAM
	Assoc. Prof. Dr. Semih Ergintav, Deputy Director, Earth and Marine Sciences Institute, MAM
18 th Meeting	Dr. Bahadır Tunaboğlu, President MAM

3. Hosting of COMSATS' Coordinating Council Meetings: MAM-Turkey hosted 15th Meeting of COMSATS' Coordinating Council, held on May 24-25, 2012, in Gebze, Turkey.
4. Research Collaborations with Network Members: To establish collaboration between TIRDO and TUBİTAK MAM-Turkey, a three-member delegation from TIRDO, headed by the Director General, Prof. Mkumbukwa Mtambo, accompanied by two Directors (Dr. Manege and Dr. Lugano) paid a visit to TUBİTAK MAM-Turkey from August 24 - 27, 2015. Based on the discussions on various issues of cooperation including coal quality determination, an MoU is being finalized between the two institutions which will show clearly the areas of cooperation and the responsibilities of each institution.
5. Participation in COMSATS' Publications:
COMSATS Newsletter: Profile of MAM was published in COMSATS Newsletter Volume 1: Issue No 3 (May-Jun 2009) and profile of President MAM was published in COMSATS Newsletter Volume 4: Issue No 3 (May-Jun 2012) and Volume 6: Issue No 4 (Jul-Aug 2014).

Summary of Manpower and Expertise Available in COMSATS Network of Centres of Excellence

Sr. #	Centre of Excellence (website)	R&D Mandate/Scientific Areas	Scientific and Academic Human Resources
1	BCSIR-Bangladesh (www.bcsir.gov.bd)	R&D focus: herbal medicine & natural products; bio- science & bio-materials; biogas technology; leather technology; microbiology; mining, mineralogy & metallurgy; nanotechnology; chemical metrology; pharmaceutical chemistry; fiber and polymer; pulp and paper; food science & technology; renewable energy; glass, ceramics & building materials; and soil & environmental science.	379 scientists including 45 Ph.Ds, 48 Ph.D scholars
2	Embrapa Agrobiologia-Brazil (embrapa.br/agrobiologia)	R&D and Technology Transfer focus: Agroecology and organic production, Recycling organic wastes, Diversification production systems, Grain production system, Energy crops, Pastures, Biological inputs (specially to Biological Nitrogen Fixation, Plant Growth Promoting and Biological Control), Landscape sustainable, Land rehabilitation, Reclamation of degraded lands, Restoration and environmental compliance and Sustainability Indicators. This Mandate/Scientific Areas contributing to priority areas of the Brazilian Federal Government: i) National Plan for Agroecology and Organic Production, ii) Sectoral Plan for Mitigation and Adaptation to Climate Change for a Consolidation Economy Low Carbon Agriculture and iii) Forest Code.	154 employees: 43 researchers, 44 analysts, 28 technicians and 39 assistants
3	ICCES-China (english.icces.ac.cn)	R&D focus: development of dynamical earth system; model and numerical simulation; meteorological and environmental forecast and related disaster assessment theory and technique; data assimilation theory and methodology; earth system theories and natural cybernetics.	48 staff members including 14 professors; 11 Associate professors and 17 Assistant professors; and 2 senior engineers

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Sr. #	Centre of Excellence (website)	R&D Mandate/Scientific Areas	Scientific and Academic Human Resources
4	CIF-Colombia (www.cif.org.co)	R&D focus: electrophysiology; molecular and biochemical biology; plant biotechnology; industrial biotechnology; optical measurement and control methods; environmental control; industrial instrumentation; industrial automation; data transmission and processing; optimization of industrial processes; and security systems.	48 staff members including 28 full-time scientists, 11 part-time researchers and 9 administrative personnel
5	NRC-Egypt (www.nrc.sci.eg)	Academic and R&D focus: health; renewable energy; water; nanotechnology and advanced materials; biotechnology; agriculture; waste management; human genetics; functional food; and Carbon nanotubes.	4,812 research staff; 470 scientific assistants; and 2,245 administrative staff
6	CSIR-Ghana (www.csir.org.gh)	R&D focus: agriculture, industry, agro-processing, fisheries, forestry, water resources, building and road construction, environment, health, and natural and social sciences.	50 senior scientists; 8 Ph.Ds; 36 post-graduates; 61 administrative and other staff
7	IROST-Iran (www.irost.org)	R&D focus: advanced materials and renewable energies; agricultural research biotechnology; chemical technology; electrical engineering and information technology; mechanical engineering; and new technology development.	135 academic staff including 4 full professors, 28 associate professors, 63 assistant professors and 15 lecturers; 158 technicians and 157 administrative staff
8	ICENS-Jamaica (www.icens.org)	R&D focus: geochemical baselines; relationship between the geochemistry of the natural environment and health; agriculture and food security; global environmental change and potential threats to Jamaica; spatial geoscience; water-resource management; and peaceful applications of the atom.	26 core staff members including 18 graduates in six specialist scientific, technical and administrative units

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Sr. #	Centre of Excellence (website)	R&D Mandate/Scientific Areas	Scientific and Academic Human Resources
9	RSS-Jordan (www.rss.jo)	R&D focus: water and environment; energy research; construction and sustainable buildings; information and communication technology; and applied scientific research.	500 staff members including science specialists, researchers, technical support staff, management, and faculty
10	KazNU-Kazakhstan (www.kaznu.kz/en/)	Academic and R&D focus: biology and biotechnology; ecological problems; new chemical technologies and materials; physical and chemical methods of research and analysis; experimental and theoretical physics; nanotechnology; mathematics and mechanics; combustion problems; engineering; and commercialization of scientific technology.	2,000 staff members including professors, doctors, Ph.Ds, laureates and fellows
11	NMC-Nigeria (www.nmcabuja.org)	Academic and R&D focus: mathematics, statistics, computer science and theoretical physics.	Over 100 academic and non-academic staff members
12	CIIT-Pakistan (www.comsats.edu.pk)	Academic and R&D focus: bioinformatics; biosciences; business administration; chemical engineering; power engineering; computer engineering; computer sciences; software engineering; economics, humanities, and architecture; pharmacy; electrical engineering; electronics; environmental sciences; earth sciences; health informatics; mathematics; physics; meteorology; and telecommunication and networking.	3,118 faculty members including 1,047 Ph.Ds; and 3,245 administrative Staff members
13	ICCBS-Pakistan (www.iccs.edu)	Academic and R&D focus: organic chemistry, molecular medicine, herbal medicines, plant biotechnology, pharmacology, computational medicinal chemistry, bio-organic synthesis and natural product chemistry, electrochemical studies, petroleum and polymers, clinical biochemistry, neuro-pharmacology, and analytical chemistry.	700 staff members including 100 academic and 250 non-academic members; 100 scientists and faculty members; 50 technicians; 200 administrative and support staff

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Sr. #	Centre of Excellence (website)	R&D Mandate/Scientific Areas	Scientific and Academic Human Resources
14	UCAD-Senegal (www.ucad.sn)	Academic and R&D focus: tropical medicine, renewable energy, biotechnology, veterinary medicine, pharmacology, environmental sciences, information science, agro-biology, and agro-chemistry.	1,329 professors, and 1,273 administrative staff and technicians
15	ITI-Sri Lanka (www.iti.lk)	R&D focus: herbal technology; materials technology; environment technology; industrial metrology; chemical science and microbiology; and electronic engineering.	341 staff members including 70 scientists/researchers (18 Ph.Ds), 17 engineers and 100 technicians
16	IRCC-Sudan (www.ircc.gov.sd)	R&D focus: chemical engineering, leather and food processing, and industrial technologies.	29 associate professors; 17 assistant professors; 25 researchers; and 76 assistant researchers 44 technicians
17	HIAST-Syria (www.hiast.edu.sy)	R&D focus: Mechatronics ; communications; mathematics; informatics; physics; electronic systems, environmental studies.	more than 104 professors; 132 Engineers, 90 technicians ; 190 administrative and support staff
18	TIRDO-Tanzania (www.tirdo.org)	R&D focus: industrial processes and products, industrial techniques and technologies, energy, ICTs, food & biotechnology, industrial chemistry and agro-processing, environment, materials science and technology, and textile and leather.	85 staff members including 30 researchers, 20 technicians and 35 administrative personnel.
19	CERTE-Tunisia (www.certe.rnrt.tn)	R&D focus: characterization and mapping of deep reservoir aquifers; hydrology, geochemistry and modeling of surface and sub-surface waters; study of artificial refilling of water-tables; developing GIS and other decision support systems (DSS); treatment of scaling of drinking and industrial waters; microbiological	195 staff members: 82 researchers, 15 engineers, 34 technicians, 64 administrative and other staff members

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Sr. #	Centre of Excellence (website)	R&D Mandate/Scientific Areas	Scientific and Academic Human Resources
20	TÜBİTAK MAM-Turkey (www.mam.gov.tr)	analysis and water treatment; re-use of urban and industrial waters; and investigation of interaction between waters, soil and water-tables. R&D focus: earth & marine sciences; energy; environment & cleaner production; genetic engineering & biotechnology; as well as food and chemical technologies.	940 staff members: 686 R&D staff members (47% Ph.Ds); 28 managers; and 226 support staff

