



COMSATS Newsletter

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

Issue 3, Volume 14

May - June 2022



Advisor to H.E. Mr. Recep Tayyip Erdoğan (President of Türkiye) & Former Executive Vice President of COMSATS' Focal Point in Türkiye – TÜBITAK – visits COMSATS Secretariat (details on page 06).

Inside this Issue

- From Editors' Desk 1
- Highlights from COMSATS Secretariat 2
- Some Activities of COMSATS' Centres of Excellence 8
- Development and S&T News from Member States and Beyond 12
- Women in Science 13
- COMSATS' Brief and Announcements 16

Patron:
Mr. Ghulam Muhammad Memon
Executive Director COMSATS

Editors:
Ms. Farhana Saleem
Ms. Isra Mahmood

Designing & Development:
Mr. Imran Chaudhry

From Editors' Desk

The industrial revolutions that humanity has witnessed over the last century or so have brought with them a gamut of social and economic gains spurred by mechanization, innovation and rapid globalization. While the world is doing well out of social and economic elements of this growth, the environmental component of it is at stake as these revolutions were greatly pivoted on the use of natural resources thus failing short with respect to a major pillar of sustainable development. Timely realization of this downside of development under the industrial revolutions has resulted in unceasing efforts at global level for the restoration and conservation of whatever is left in the natural reserve, more importantly for preservation of the environment.

An integral instrument for these efforts is the advocacy and awareness raising about the current and imminent (environmental) challenges and their likely repercussions. While policy making lays the ground, continuous advocacy is imperative for the execution of plans and implementation of solutions with right involvement of civil society, public and private sector to help achieve the desired outcomes. It could also serve as a means to mobilize resources and brokering partnerships both being indispensable tools in achieving United Nations' 2030 Global Agenda for Sustainable Development.

Observances and commemorations also constitute an important aspect of advocacy and international organizations are playing an effective role towards this end. In the spirit of this, United Nations marks a multitude of days and weeks throughout the year to help galvanize relevant efforts at every tier. Championing this cause and delivering on its mission, COMSATS also hosts activities and events with the scope and theme under various dimensions of sustainability. Activities that took place during the reporting period of this issue aimed at providing a platform to relevant stakeholders to discuss and have dialogue on the root causes of global challenges and suggest mitigative measures to combat them. These events had the overarching themes of SDG7 (Affordable and Clean Energy), SDG9 (Industry, Innovation and Infrastructure), SDG 13 (Climate Action), SDG14 (Life Below Water), SDG15 (Life on Land), and SDG17 (Partnerships for the Goals).

Also, a notable highlight of the reporting period is the winning of Commonwealth Digital Health Awards 2022 by COMSATS Telehealth Programme in view of its efforts to provide affordable healthcare to remote communities through digital technologies. Further, this issue reports some interesting developments by COMSATS Centres of Excellence and Member States.

Feedback on contents of this issue and COMSATS' undertakings is welcome.

✉ comsats@comsats.org ☎ (+92-51) 9214515-7

HIGHLIGHTS FROM COMSATS SECRETARIAT

Chairperson COMSATS Consultative Committee Briefed

The Federal Secretary, Ministry of Science and Technology (MoST), Government of Pakistan, Mr. Ghulam M. Memon, was given briefing on COMSATS on 23rd June 2022. Apart from being the ex-officio chairperson of COMSATS Ministerial Consultative Committee, Mr. Memon also currently holds the interim charge of Executive Director COMSATS' office.

Held at the Ministry of S&T, the briefing was also attended by senior officials of the Ministry, including Additional Secretary, Mr. Ata ur Rahman; Joint Secretary (Organization), Mr. Miran Mohyuddin; and Joint Scientific Advisor (International Liaison), Mr. Zain ul Abedin. The following senior officials of COMSATS Secretariat gave the briefing: Director (A&E), Mr. M. Bilal Chohan; Director (F&A), Mr. Amanullah Khattak; and Deputy Director (Programmes), Mr. Irfan Hayee.

The briefing session commenced with an introduction given by the Additional Secretary about COMSATS and the organization's flagship higher education project – COMSATS University Islamabad (CUI), and pioneer ISP – COMSATS Internet Services (CIS). After the brief introduction by the Additional Secretary MoST, Mr. Hayee made a multimedia presentation on COMSATS' programmes. He also gave an overview of the historical perspective that led to the establishment of COMSATS in 1994 and highlighted COMSATS' objectives that translate into its programmes and activities. He further elaborated the role and functions of the organization's statutory bodies, including its General Meeting, Consultative Committee, Coordinating Council and the Technical Advisory Committee. He informed Mr. Memon that these bodies are neatly

interlinked and constitute a structure that not only affords the organization the highest political leverage, but also provides a sound scientific/technical base for its programmes aimed at national and regional development. Mr. Hayee, highlighted the diversity and commonality of resources and challenges among COMSATS' Member States that provide a useful landscape for South-South and Triangular Cooperation.

The Ministry officials were also briefed about ongoing programmes and activities of COMSATS. The status of the statutory body meetings of COMSATS came under review and it was informed that COMSATS is making preparations to hold meetings of its Coordinating Council and Technical Advisory Committee. These meetings would further enable the organization to take a periodic review of its strategic direction and coordinate international programmes.

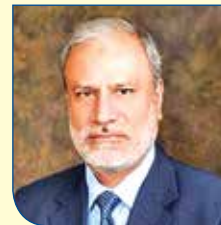
Pakistan's Foreign Office Briefed about COMSATS

On 24th June 2022, a meeting was held between COMSATS' officials and senior officials of Ministry of Foreign Affairs (MoFA), Government of Pakistan. The purpose of the meeting was to brief the MoFA officials about COMSATS and its activities, as well as recent engagements with the office of COMSATS Chairperson, H.E. Nana Addo Dankwa Akufo-Addo, President of Republic of Ghana.

From COMSATS, Mr. Nisar Ahmad, Deputy Director (Coordinator – Chairperson Office) and Mr. Farhan Ansari, Senior Assistant Director (Programmes) held the meeting with Mr. Naeem Ullah Khan, Director General (African Region), and Mr. Arshad Abbassi, Director (African Region), MoFA.

Profile of Incumbent Executive Director COMSATS

Mr. Ghulam Muhammad Memon took charge as the Federal Secretary at the Ministry of Science and



Technology, Government of Pakistan, on 6th June 2022. By virtue of his current office, Mr. Memon is the incumbent Chairperson of COMSATS Consultative Committee. He is currently the interim Executive Director of COMSATS.

Having served as an Additional Auditor General-I, Mr. Memon has more than 33 years of diverse experience in public sector. He has expertise in areas of Policy Formulation and Governance, Auditing and Accounting, and Financial and Human Resource Management.

Earlier in his career, he held the portfolios of President at Audit Commission of Asia-Pacific Space Cooperation Organization (APSCO), China; Head of Department/Director General at Field Audit Offices of Commercial Audit, Defense Audit, and Local Councils Audit Sindh; Deputy Controller Air Force Accounts and Controller Military Accounts (Karachi) at Pakistan Military Accounts Department; Head of Finance Department at Pakistan Steel Mills, Employees Old-Age Benefits Institution, University of Sindh, and Pakistan Space and Upper Atmosphere Research Commission (SUPARCO).

The visiting COMSATS' officials briefed the MoFA officials about COMSATS' structure, member countries, statutory bodies, programmes and activities. Mr. Farhan Ansari gave an overview of COMSATS' flagship projects, i.e., COMSATS University Islamabad (CUI) and COMSATS Internet Services (CIS), as well as various ongoing programmes including capacity building activities. He gave a detailed insight on COMSATS' Network of International S&T Centres of Excellence and its activities.

Mr. Nisar Ahmad, being the Coordinator for COMSATS' Chairperson Office, informed the MoFA officials about the recent interactions with the office of Chairperson of COMSATS, especially with reference to preparations for the next General Meeting of COMSATS' Commission in Accra. It was informed that a high-level international conference is planned to be held parallel to the Commission meeting.

Mr. Naeem Ullah Khan informed COMSATS' officials that, as conveyed by the Pakistan High Commission in Accra, the Hon. President of Ghana, has expressed desire to convene an international conference in Accra, being the Chairperson of COMSATS. COMSATS' officials welcomed this development, for which preparatory and coordination work would be expedited at COMSATS Secretariat.

CCIB Workshop on Bioenergy to Achieve Carbon Neutrality

COMSATS Joint Centre for Industrial Biotechnology (CCIB) organized an online workshop on 'Bioenergy: A Road to Carbon Peaking and Carbon Neutrality' under its Joint R&D Group on Bioenergy. Held on 14th June 2022, the Workshop was aimed at encouraging meaningful dialogue between scientists and exploring potential cooperation for joint R&D



to meet industrial needs. Over a 100 scientists and researchers from China, Egypt, Iran, Jordan, Pakistan, Tanzania, Thailand, and Türkiye participated in the Workshop.

The event was inaugurated by Prof. Dr. Jibin Sun, Director of CCIB, and Deputy Director-General of the Tianjin Institute of Industrial Biotechnology (TIB), China. Prof. Sun considered bioenergy an important renewable energy resource having the potential to address challenges of resource scarcity and environmental degradation.

In his opening remarks, Prof. Dr. Ashraf Shaalan, Chairperson of COMSATS Coordinating Council (Former President, National Research Centre of Egypt), noted that the global energy consumption has increased dramatically and over the next two decades the demand is expected to rise to 44%. This situation can be eased with judicious use of RETs. He lauded CCIB's efforts to enhance cooperation among COMSATS Member States in the field of industrial biotechnology.

In his keynote talk on 'Bioengineering beyond Cells to Enable a Fair and Sustainable 21st Bio-century', Prof. Michael C. Jewett, Director of Center

for Synthetic Biology at Northwestern University, USA, underscored the significance and applications of Synthetic Biotechnology (SB). Prof. REN Nanqi, Professor at Harbin Institute of Technology, China, delivered the second keynote talk titled 'Perspective of Fermentative H₂ Production Technology from Biomass for Commercialization'. Establishing the significance of green hydrogen as an alternative energy resource, Prof. Nanqi informed that his research team is working on hydrogen production system optimization using comparative genomics, gene expression, and pathway and network stimulation. The various topics discussed by Prof. Nanqi during his talk included: fermentative H₂ production; Bio-H₂ from biomass; and Bio-H₂ for commercialization.

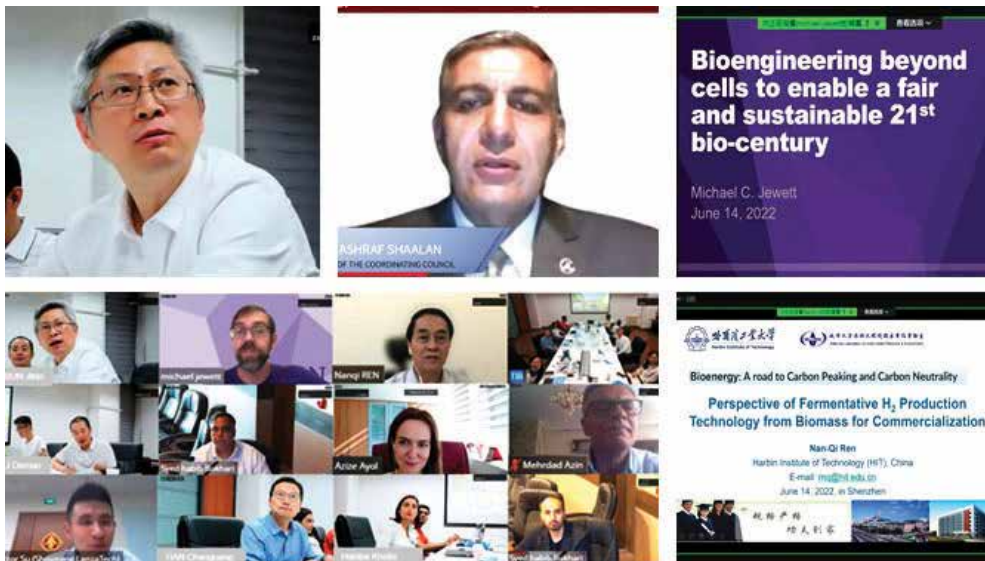
During his presentation on 'Production of Energy and Climate Friendly Bio-based Products & Ecosystem Restoration of Mountainous Region', Prof. Habib Bokhari, Vice Chancellor of Kohsar University, Pakistan, discussed potential solutions to current global challenges especially in the context of Pakistan. He stated that Pakistan is facing major challenges, inter alia, in the form of untimely floods, heat waves, decreased rainfall, food insecurity,

melting glaciers, rising temperatures, forest fires, biodiversity loss, and poor solid waste management. To mitigate such challenges, projects and methods have been introduced, such as genetically modified arsenic-based biosensors for water purification, bio-conversion of waste food, environmentally friendly eco-tourism, and precision and smart agriculture.

Prof. Azize Ayol, Professor at Dokuz Eylul University, Türkiye, gave a presentation on 'Syngas Production from Biomass and Microbial C1 Gas Conversion Technologies', in which she informed about an on-going research project on 'sustainable energy recovery from treatment plant sludge, green wastes, and olive pomace via gasification process: investigation of beneficial usage alternatives of gasification products' that is being run jointly by TÜBİTAK and Environment, Atmosphere, Earth and Marine Sciences Research Grant Committee (CAYDAG) of Türkiye.

Prof. Mehrdad Azin from the Iranian Research Organization for Science & Technology (IROST), Iran, delivered a presentation on 'Bio-refinery Processes for Production of Biofuels: Steps Paved by Iran', in which he shed light on the bio-refinery processes used for production of biofuels. He also informed the participants about the Qeshm Microalgae Biorefinery (QMAB) which is utilizing advanced technology to provide environment friendly solutions.

Mr. Victor Su from Beijing Shougang LanzaTech New Energy Technology Co., Ltd, China, delivered a presentation titled 'Producing Ethanol and Protein from Carbon Containing Industrial off-gas through Synthetic Biotechnology'. He informed that his company is one of the leading bio-manufacturing companies in the country, providing production solution to country's 'protein bottleneck' problems.



During the presentation on 'Construction of Fungal CBP Technology for Lignocellulose Biorefinery', delivered by Prof. TIAN Chaoguang, Professor at TIB, the participants learnt about the traditional cellulosic biomass conversion; consolidated Bio-Processing (CBP); transformation tools for the fungus denovo; genome scale metabolic model; utilization of biomass derived sugars in filamentous fungi; and direct conversion of lignocellulosic biomass.

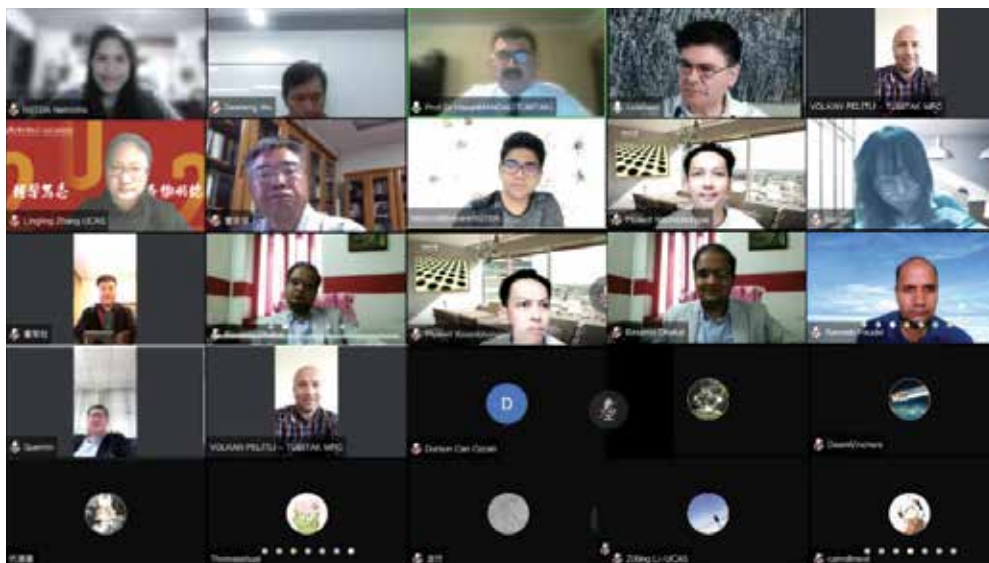
Briefing the participants about the progress of CCIB's Joint R&D Group on Bioenergy, the Group Coordinator, Prof. LI Demao, informed that two R&D projects are currently being run; one on organic waste and the other one titled 'The Belt and Road Fellowship Initiative of Tianjin Synthetic Biotechnology Innovation Capacity Improvement Project'.

On conclusion of the event, Prof. Bokhari proposed initiating pilot-scale studies on biomass and bio-materials to help boost bio-energy resources. Prof. Azin suggested exchange of technologies among the members of the Joint R&D group on Bioenergy.

Fourth Term of COMSATS-ANSO-UCAS Training

COMSATS collaborated with the Alliance of International Science Organizations (ANSO), and the Centre for Environmental Economics of the University of Chinese Academy of Sciences (CEE-UCAS), China, to organize the fourth term of ANSO-BIDI School on 'Innovation, Sustainable Development, and Leadership Enhancement' under the Belt and Road International Innovation Development Institute Network (ANSO-BIDI Institute Network). COMSATS has been collaborating with CEE-UCAS to promote capacity-building of developing countries in the fields of science and technology under a Memorandum of Understanding signed in July 2020.

The opening ceremony of the event was held virtually on 4th May 2022 and had the virtual participation of leaders from collaborating organizations; 42 trainees belonging to different COMSATS Member States including Egypt, Kazakhstan, Nigeria, Pakistan and Sudan; as well as officials of COMSATS Secretariat. The event was opened by Prof. Desheng Wu, Dean of the Belt



and Road College of UCAS, Director of the Research Centre for Environmental Economics of UCAS, China.

Speaking at the opening, Prof. Dr. Ashraf Shaalan, Chairperson COMSATS Coordinating Council, stated that the world is currently undergoing massive technological, demographic, environmental, and geopolitical developments that are posing numerous challenges as well as great opportunities for human development.

Prof. Shaalan informed that COMSATS has been playing an important role in facilitating socio-economic growth of the developing countries through a variety of initiatives related to capacity-building, collaborative research and development, and the exchange of knowledge, experiences, and best practices. He also pledged COMSATS' continued active role in the ANSO-BIDI Institute Network to achieve collective goals in future.

The ceremony was followed by first module of the training during which Prof. Luis Seco, Director of RiskLab and President and CEO Sigma, Canada, delivered lecture on 'Sustainability, Technology, and Social Sciences'.

The training has 10 weekly modules spanning over 3 months, during which professors and experts from reputable international scientific and academic institutions would impart training on topics concerning subject theme.

Webinar to Observe International Day for Biodiversity (2022)

On 24th May 2022, COMSATS observed the United Nations International Day for Biological Diversity 2022 by holding a webinar entitled 'South Views on Post-2020 Global Biodiversity Framework'. The event was organized by COMSATS Centre for Climate and Sustainability (CCCS) in collaboration with the World Wide Fund for Nature (WWF). The theme of the event – "Building a shared future for all" – was chosen in the light of the post-2020 Global Biodiversity Framework, to be established at the UN Convention on Biodiversity's 15th Conference of Parties (COP15) in June 2022.

More than 50 academics, students, and specialists from China, The Gambia, Ghana, India, Jamaica, Jordan, Kazakhstan, Nigeria, Pakistan, and Türkiye participated in the webinar

both physically and virtually. The goal of the webinar was to emphasize the importance of biodiversity and conservation, as well as to raise awareness on biodiversity in developing countries. Experts from China, Ghana, India, Jordan, and Pakistan participated as panelists in this webinar, discussing the concerns, sharing their experiences, and suggesting sustainable strategies to conserve biodiversity.

Opening the event, Ambassador Shahid Kamal (Former Advisor COMSATS Climate Change) discussed the importance of sustainable development and biodiversity in the context of climate change.

Mr. Naeem Ashraf Raja, Director, Biodiversity at Ministry of Climate Change, Pakistan, delivered the keynote address. He delineated on challenges and opportunities associated with the Convention on Biodiversity. He shared the road map for the upcoming COP15 in China, in which parties will deliberate on ways to achieving targets by 2030.

In his presentation, Prof. Zhiyoun Huang, Coordinator of the COMSATS Joint Center for Industrial Biotechnology (CCIB), emphasized that understanding on response of Earth's biosphere to global climate change will remain profoundly limited unless there is a recognition of importance of microbial diversity. This could jeopardize prospects for building an environmentally sustainable future. Prof. Huang discussed the central role of microbial diversity in rock and soil chemical process to mitigate climate change and also explained how climate change is influencing microbial diversity.

Ms. Hamera Aisha of WWF-Pakistan discussed the efforts made for conservation of Indus river dolphin and factors affecting the population of the species, including construction of dams and barrages and fishing activities in the

downstream of river Indus. Ms. Aisha emphasized the need for modeling threats to biodiversity at different scales, directing future research, resource allocation, and efficient policies, legal frameworks, and regulations.

Dr. Akwasi Duah-Gyamfi, Head of Biodiversity Conservation and Ecosystem Services Division of the Forestry Research Institute of Ghana, shared views about forest ecosystem and role of biodiversity. He highlighted that invasive species, illegal farming, agriculture activities, timber industry and urbanization are major threat to forest biodiversity. Underpinning the theme of the day “Building a shared future for all”, he added that our food, medicine, and survival depends upon natural resources available through biodiversity. Natural resources, he asserted, are a common wealth that should be consumed wisely to ensure that enough is left for future generations.

Dr. Dipanker Ghose, Director, Species & Habitats, WWF-India, spoke on how environmental degradation and climate change destroy wildlife and their habitat. He considered urbanization and industrialization serious threats to environmental health and integrity. He further informed that during the last half-century, global economic expansion has drastically altered people’s lifestyles that comes at a massive cost to the environment.

Dr. Khaled Abulaila, Director of Biodiversity and Plant Genetic Resources, National Agriculture Research Center, Jordan, gave a talk on Conservation of Plant Biodiversity for Food. He explained how the rich genetic pool of crop species helps against extreme conditions and huge yield. He appreciated NARC’s commitment to seed conservation in Jordan, as well as herbarium management.



The technical talks of the webinar were followed by a panel discussion moderated by Dr. Imran Khalid, Director, Governance and Policy, WWF-Pakistan. During the panel discussion, experts were engaged in the discussion on how the climate and biodiversity crises are intertwined, as well as the critical role that South-South cooperation can play in restoring ecosystems and biodiversity, as well as adapting to and mitigating climate change.

Concluding the event, Mr. Hammad Naqi Khan, Director General, WWF-Pakistan, thanked the participants, specialists and organizers of the event. Mr. Naqi also highlighted activities of WWF-Pakistan in the field of biodiversity protection.

COMSATS Condolences Demise of the President of UAE

COMSATS’ condolences and expression of solidarity on the sad demise of His Highness Sheikh Khalifa bin Zayed bin Sultan Al Nahyan, the President of the United Arab Emirates (UAE), were communicated to the Embassy of UAE in Islamabad, on 18th May 2022. In this regard, Engr. Qaiser Nawab, Assistant Director (Programmes) at COMSATS Secretariat, called on H.E. Mr. Hamad

Obaid Ibrahim Al-Zaabi, Ambassador of UAE to Pakistan. He remarked on the legacy of unprecedented growth, prosperity and development that Late President has left behind for UAE and assured His Excellency of COMSATS’ highest consideration of the Government of UAE.

Sheikh Khalifa, who was included in Forbes 2018 list of most powerful people, was the second President of UAE. He held the office of the President of UAE from November 2004 till his demise in May 2022.

Visit of Turkish Delegation

Dr. Orkun Hasekioğlu, Advisor to the President of Türkiye – H.E. Mr. Recep Tayyip Erdoğan, visited COMSATS Secretariat on 15th June 2022. Dr. Hasekioğlu was visiting Islamabad in connection with his participation in International Workshop on ‘Research Commercialization: Challenges and Opportunities’ organized by OIC COMSTECH. Dr. Hasekioğlu was accompanied by Dr. Mustafa Güzel, Director of Drug Discovery and Development Research Center at Istanbul Medipol University, Türkiye. Dr. Hasekioğlu is currently serving as the Vice President of TENMAK, Türkiye,

and had previously held the portfolio of Executive Vice President of the Scientific and Technological Research Council of Turkey (TÜBİTAK), which is COMSATS' Focal Point in Türkiye.

The meeting explored COMSATS' relations with Türkiye and TÜBİTAK and eyed strengthening the established cooperation to help facilitate science-led development in the global South.

The visiting delegates were briefed about past and ongoing collaborations between COMSATS and its Focal Point in Türkiye, i.e., TÜBİTAK. It was noted that TÜBİTAK possesses enormous human and technological resources that can be used to execute programmes for the benefit of COMSATS' Members States and are already contributing to COMSATS' mission through a number of means.

Discussions on planned meetings of COMSATS Coordinating Council, activities of COMSATS' Network and its thrust areas, scholarships and fellowships, capacity-building activities, and information exchange were also made during the meeting.

Prof. Hasekioglu appreciated COMSATS as a potent platform working for socio-economic uplift of the developing countries. He was appreciative of COMSATS Telehealth Programme, as well as the recent COMSATS' Lecture Series, which featured presentations by distinguished scientists, policy experts, and S&T leaders on various issues linked to sustainable development.

COMSATS Telehealth: Developments and Achievements

Since 2001, COMSATS Telehealth Programme (CTH) has been making efforts to meet the healthcare needs of remote areas of Pakistan.

On 7th June 2022, the Federal Minister of Science and Technology, Mr. Agha Hassan Baloch, inaugurated the new Telehealth resource centre at CIS Technology Park. The Minister was also given a briefing on the operations of CTH and its various remote clinics in Pakistan. The Minister is to inaugurate another tele-clinic in Quetta in July 2022.

Operational as COMCLINIC from CIS, CTH Telemedicine service has been recognized as best programme in Telemedicine category during 5th Commonwealth Centre for Digital Health (CWCDH) Awards ceremony held on 9th June 2022.

CTH won the award in recognition of its endeavors to provide the marginalized communities with equitable, affordable and quality healthcare through digital technologies.

CCCS Representative Participates in Environment Day Events

As a core team member of COMSATS Centre for Climate and Sustainability (CCCS), Mr. Saifullah Khan Dilazak, represented COMSATS at World Environment Day events held in Islamabad.

On 6th June 2022, Standing Committee of Organization of Islamic Countries (OIC) on Science and Technology (COMSTECH) organized a launching ceremony of COMSTECH Forum on Ecosystem and Environment (CFEER) and webinar on Land Degradation on the occasion of World Environment Day, 2022 with the theme 'Only One Earth'.

Scientists from The Gambia, Tanzania, and Tunisia, i.e., Dr. Mamma Sawaneh, Ms. Jacqueline Mwenda, and Prof. Sihem Benabdallah, respectively, represented CCCS in the panel. CCCS founder and Advisor Climate Change, COMSTECH, Amb. Shahid Kamal, also spoke on the occasion alongside Prof. Dr. Iqbal Chaudhary, Director General COMSTECH.

The other World Environment Day event attended by Mr. Dilazak had been organized by Pakistan Mission Society and GIZ, Pakistan, on 7th June 2022.



SOME ACTIVITIES OF COMSATS' CENTRES OF EXCELLENCE

President of RSS-Jordan Appointed as ISC Fellow

Her Royal Highness Princess Sumaya bint El Hassan, President of Jordan's Royal Scientific Society (RSS), has recently been appointed by the International Science Council (ISC) as one of its 66 Foundation Fellows. The appointment has been made based on Princess Sumaya's exceptional contributions to science and diplomacy for the global public good.

This Fellowship is ISC's highest honor that can be conferred on an individual.



Forum at RSS-Jordan Encourages Implementing Circular Economy Measures

RSS, Jordan, hosted the first forum on introducing circular economy measures to Jordanian food industries, on 31st May 2022. The Forum was part of an applied research project on the green economy, and efficient and cleaner production of resources, funded by the Newton Khalidi Fund at the British Embassy and implemented by the Water, Environment and Climate Change Centre at RSS.

At the Forum, the experts presented a detailed explanation of the concept

of circular economy and industry 4.0 tools to food factories, decision-makers, and regulatory and governmental bodies, which is basically based on the protection of natural resources and the application of the resource efficient and cleaner production methodology.

Roundtable at RSS-Jordan Explores Prospects of Sustainable Energy Investment

A national roundtable within the Mediterranean Sustainable Energy Investment Forum was organised by RSS/National Energy Research Centre to discuss ways to invest in sustainable energy in the Mediterranean region.

The roundtable was held on 7th June 2022 within the Mitigation Enabling Energy Transition in the Mediterranean region (meetMED) project, which is an EU-funded project, developed by the Mediterranean Association of the National Agencies for Energy Management (MEDENER) and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE).

More than 40 participants from the finance sector, national government, EU Commission in Jordan, European Investment Bank, UN agencies, project developers, renovation supply chain and local and regional energy agencies discussed issues related to financing and investment in the field of improving energy efficiency.

Experts and specialists in the field of energy engaged in a detailed dialogue about the prospects of sustainable energy investment in the Mediterranean with the aim of strengthening regional cooperation in the field of transition towards sustainable energy and improving energy efficiency.

They also discussed topics related to renewable energy in buildings,

appropriate mechanisms for financing and investing in the field of energy, and solutions for challenges that impede development of the energy sector within the national framework.

HIAST-Syria Signs Pol with SPbPU-Russia

The Higher Institute for Applied Sciences and Technology (HIAST), Syria, has signed a Protocol of Intent on cooperation with the Polytechnic University (SPbPU), Russia. The protocol was signed during the visit of a delegation from HIAST to SPbPU.

The document provides for development of partnerships in science and education, including the development of joint graduate and postgraduate programmes, academic mobility of teachers and students, and implementation of joint research in various fields.



KazNU-Kazakhstan Sets-up Branches in Turkey and Kyrgyzstan

Al-Farabi Kazakh National University (KazNU), Kazakhstan, has established its branches in Istanbul – Türkiye and Bishkek – Kyrgyzstan. The institution of the former branch was materialized during a meeting between the



Presidents of Kazakhstan and Türkiye – H.E. Mr. Kassym-Jomart Tokayev and H.E. Mr. Recep Tayyip Erdoğan – that resulted in an agreement to bring the Kazakh-Turkish relations to the level of an expanded strategic partnership. Subsequent to this, the branch was opened during the visit of H.E. Mr. Tokayev to Türkiye.

The Turkish branch will carry out higher professional education, promote the integration of science and education in the international scientific and educational space, provide scientific, methodological, and personnel support for the development of science and education, and ensure the competitiveness of the university on the global landscape.

On the other hand, the Agreement to open Al-Farabi KazNU branch in Kyrgyzstan was reached during the state visit of the President of Kyrgyzstan, H.E. Mr. Sadyr Nurgozhoevich Japarov, to Kazakhstan during March 2021. An opening ceremony of the branch was held on 26th May 2022 during the official visit of the Head of State of Kazakhstan to Kyrgyzstan.

The branch in Bishkek will offer training in 13 programmes for bachelor and master degrees and will offer programmes in three languages – Kyrgyz, Russian and English.

Russian University to Establish a Branch at KazNU-Kazakhstan

Al-Farabi KazNU, Kazakhstan, signed an Agreement with the National Research Nuclear University MEPhI (Moscow Engineering Physics Institute) of Russia to open a branch at KazNU. The Agreement signing took place on 1st June 2022 in a ceremony attended by the Chairman of the Board/ Rector of Al-Farabi KazNU, Prof. Zhanseit Tuymebayev, and Rector of NRNU MEPhI, Dr. Prof. Vladimir Shevchenko.

The branch will help execute joint training of specialists in the field of nuclear physics, laser and plasma technologies, nuclear energy, nanomaterials, nanotechnologies, nano-electronics and relevant areas by providing education at bachelor's, master's and doctoral level.

KazNU-Kazakhstan Enhances Cooperation with Asian and European Universities

During the reporting period, various meetings were held by the Rector of Al-Farabi KazNU (Prof. Zhanseit Tuymebayev) with the representatives of universities from Belarus, France, Japan, and Tajikistan, with the aim to explore cooperation avenues in common areas of interest. Agreement signing was also

a part of one of these meetings.

The meetings were held with Rector of Tajik National University, Prof. Dr. Khushvakhtzoda Qobiljon Khushvakht; and Deputy Chairman of the National Academy of Sciences of Belarus, Mr. Piotr Vityaz. During these meetings, Prof. Tuymebayev expressed readiness to develop partnerships with universities in Tajikistan and research institutes in Belarus to help create greater opportunities for development of new innovative technologies.

Additionally, on the sidelines of 8th Meeting of the Universities' Board of Directors held at Université Grenoble Alpes – France, the Rector of KazNU signed Agreements with University of Bordeaux (France), University of Grenoble-Alpes (France) and the University of Tsukuba (Japan).

Scientists at KazNU-Kazakhstan Develop Cheaper Renewable Hydrogen

A group of researchers from the Faculty of Chemistry and Chemical Technology of Al-Farabi KazNU, Kazakhstan, is conducting research on the development of efficient photocatalysts for converting solar energy into renewable hydrogen.



The developed technology of solid-phase mechanochemical synthesis of photocatalysts is economically feasible in contrast to other methods for obtaining photocatalysts. Therefore, the resulting nanocomposites will have a low cost. According to the scientists working on the project, the results will increase the profitability of photocatalytic hydrogen production using solar energy and will become an alternative to oil to help solve the pressing issue of finite natural resources.

Higher Ranking of Al-Farabi KazNU-Kazakhstan

Al-Farabi KazNU, Kazakhstan, has moved 25 places up on global Quacquarelli Symonds World University Rankings (QS WUR) 2022 securing 150 position on the list. The ranking gauged 2,462 higher education institutions out of which 1,422 were selected as the strongest.

Al-Farabi KazNU's Renewal of UNAI Hub Status

Al-Farabi KazNU, Kazakhstan, was the first Central Asian university to join United Nations Academic Impact Program (UNAI) programme in 2011 and later in 2014, entrusted with the

role of acting as UNAI Global Hub for Sustainable Development. This year, KazNU's status to act as UNAI Hub has been renewed.

Being UNAI's Hub on Sustainable Development, Al-Farabi KazNU was invited to participate in Workshop on "Effective Research on the 2030 Agenda" held at the headquarters of the United Nations in New York, USA. A presentation on the activities of the university towards the implementation of the Sustainable Development Goals, ongoing research and development was presented by Ms. Aizhan Smailova (Director of the Institute for Sustainable Development), Prof. Vitaly Salnikov (Dean of the Faculty of Geography and Environmental Management), and Prof. Aina Rysmagambetova (Deputy Dean of the Faculty of Geography and Environmental Management).

UTG-The Gambia Eyes Establishing Forensic Entomology Lab

Department of Biology, the University of The Gambia (UTG), The Gambia, has been awarded a grant by the American Academy of Forensic Sciences (AAFS) to establish a Forensic Entomology Laboratory at the University. The

laboratory would be the first ever initiative towards the practice of such forensic science in the country.

Apart from offering support during investigations, the laboratory would conduct and promote research, as well as provide professional and academic training.

Director of ICCBS-Pakistan Receives ITA Award in Kazakhstan

In recognition of his outstanding contributions to the development of cooperation in the Turkic world, Prof. Dr. M. Iqbal Choudhary, Director of the International Center for Chemical and Biological Sciences (ICCBS), Pakistan, has been conferred Al-Farabi International Gold Medal by International Turkic Academy (ITA) of Kazakhstan.

The Medal, along with a Certificate of Merit, was presented to Prof. Iqbal by President of the Academy, Dr. Darkhan Kydyrali, on the occasion of International 'Al-Farabi – Iqbal' Forum held on 26th and 27th May in Almaty, Kazakhstan.



Prof. Paul Pinnock Bosu, New Director of CSIR, Ghana

Professor Paul Pinnock Bosu assumed charge as the new Director General (DG) of the Council for Scientific and Industrial Research (CSIR), Ghana, on 11th May 2022.



Prof. Bosu has succeeded Prof. Victor Kwame Agyeman.

Earlier, Prof. Bosu had served as the Deputy Director-General (DDG) of CSIR from January 2019 to April 2022, as well as the Deputy Director of the CSIR-Forestry Research Institute of Ghana (CSIR-FORIG) in Kumasi.

Prof. Paul Bosu is a PhD in Forest Entomology from the Northern Arizona University (NAU), USA, specializing in mechanisms of plant resistance to insect pests. Starting his career as a national service person in November 1994 at CSIR, Prof. Paul P. Bosu became Chief Research Scientist in January 2018 at the Council. He has also served as Associate Professor of Entomology at CSIR College of Science and Technology (CCST). Prof. Bosu served as the Deputy Coordinator of the International Union of Forest Research Organizations' Working Party on Diseases and Pests of Tropical Forests. He is a Founding Member, as well as Executive Committee Member of the Forest Invasive Species Network for Africa (FISNA).

Prof. Bosu also holds membership of the Executive Committee of the Modernising Agriculture in Ghana (MAG) Programme; Advisory Board of the College of Basic and Applied Sciences (CBAS) of the University of Ghana; and Board of the Centre for Plant Medicine Research (CPMR).

Prof. Paul Bosu has authored/co-authored over a 100 scientific

publications and attracted research grants to CSIR-FORIG for Research and Development (R&D) programmes.

In 2018, the Northern Arizona University School of Forestry recognized his work with the Distinguished Alumnus Award of the School (the First International Student to receive the Award). Earlier in December 2007, he was also awarded the National Best Agricultural Researcher Award.

TÜBİTAK-Türkiye Inks MoU with DGRSDT-Algeria

The Scientific and Technological Research Institution of Türkiye (TÜBİTAK) has signed an Agreement with the General Directorate for Scientific Research and Technological Development (DGRSDT), Ministry of Higher Education and Scientific Research of Algeria.

The signed Agreement would provide a base for establishing cooperation between research institutions in Türkiye and Algeria in the fields of scientific research, technological development, and training for the preparation and implementation of joint projects, organization of joint scientific workshops and scientific exchanges.

Social Sciences Encyclopedia Introduced by TÜBİTAK-Türkiye

Working with the aim to guide and support the science-based development of Türkiye, TÜBİTAK has launched an Encyclopedia of Social Sciences.

The publication containing scientific and technological information would support academic and industrial R&D activities and would help increase awareness of science and technology in all segments of society.

Researchers at ICCBS-Pakistan Study Vertical Transmission of SARS-CoV-2

A comprehensive research study carried out at Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) of ICCBS, Pakistan, concludes that the risk of transmission of SARS-CoV-2 from an infected mother to the neonate is extremely rare. The study was conducted at the National Institute of Virology in collaboration with the Zainab Panjwani Memorial Hospital.

In this study, 140 pregnant women were randomly enrolled from March to December 2021 and closely monitored for infection during different waves of the Pandemic. The observed women showed mild to moderate symptoms without showing any severe symptoms even during the peak of the Pandemic. The women with and without infection had similar clinical presentation of symptoms. Based on the findings, it was concluded that COVID-19 infection in pregnancy is not a risk factor for C-sections, miscarriage, preterm births, or maternal mortality. Although, the virus could not be detected in any baby immediately after birth, the transfer of antibodies was commonly observed. The study was first of its kind on the South Asian population during the pandemic.

R&D Activities at NMC-Nigeria

Several research and scientific projects on various aspects of environmental issues are afoot at National Mathematical Centre (NMC), Nigeria. These include:

- Research study on the impact of industrial chemical leakages and chemical residual in agricultural lands and groundwater and its environmental impact assessment;
- Application of modelling and

simulation in the oil and gas sector for optimization of oil recovery and profit to help reduce litigation due to oil spillages. The project is also aimed at providing simulation-driven methods of monitoring pipeline damage in order to develop resources for the training on the use of mathematical modelling and simulation;

- Study on the reduction of air and water pollution through intensification, water management and biochemical oxygen demand (BOD) models;
- Use of numerical simulation to analyze the transportation of pollutants in blood flow to heart, kidney and the liver, as well as to study the pathogenesis and physiology of the vital organs when the fluid system in the body contains pollutants;
- Under a research project titled “The Modelling and Predicting the

spread of COVID-19 in different Regions in Africa”, NMC, Nigeria, is studying the epidemiology of COVID-19 using mathematical modelling and simulation. The project involves researchers from Egypt, Morocco, Nigeria, and USA, and is being conducted in collaboration with the Arab Academy for Science, Technology and Maritime (AASTMT), Egypt. NMC won this project through DATA4COVID19 Africa Challenge.

CUI-Pakistan Enhances Cooperation with Uşak Üniversitesi, Türkiye

COMSATS University Islamabad (CUI), Islamabad, has inked an inter-institutional agreement with Uşak Üniversitesi of Türkiye to expand cooperation in academic and applied research as well as to formalize student and staff exchange.



The Agreement was signed by Rectors of both universities – Prof. Dr. Muhammad Tabassum Afzal, and Prof. Ekrem Savaş.

DEVELOPMENT AND S&T NEWS FROM MEMBER STATES AND BEYOND

Egypt’s Developments Towards Clean Energy and Climate

A joint project between Egypt and Italy aims to capture and store about 30,000 tonnes of carbon dioxide annually. The project – Eni – to be undertaken under cooperation between Egyptian institutions and Italian energy company, will have the investment of \$25 million, as announced by Tarek El Molla, Egypt’s Minister of Petroleum and Mineral Resources. The project is a logical precursor to Egypt hosting COP27 later this year (TheNationalNews.Com; 4th May 2022).

Although Egypt contributes to only 0.6 % of the world’s carbon dioxide emissions, climate change remains a

global issue posing threats to the world indiscriminately. In addition to other remedial measures, much of the carbon dioxide would need to be removed actively to contain the rising global temperatures. This Egyptian project will also seek to enhance biofuel production to the scale of 350,000 tonnes and reduce 1.2 million tonnes of carbon dioxide, annually. Three other projects on biodegradable plastics, plastic to oil conversion will help reduce 45,000 and 30,000 tonnes of carbon dioxide, respectively.

Another step in this direction is the National Climate Change Strategy (NCCS) 2050, recently launched by the Prime Minister of Egypt, which recognizes that the country is among

those nations which are most vulnerable to climate change (AfricaNews.Com; 20th May 2022).

Ghana’s President Akufo-Addo Honored With AFTRA Highest Award

On 30th May 2022, the President of Ghana, H.E. Nana Akufo-Addo was awarded the highest award by the Africa Federation of Teaching Regulatory Authorities (AFTRA) for promoting education in Africa (NewsGhana.com; 30th May 2022). He was presented the Award at the ninth AFTRA and Learning Conference and 11th Roundtable on ‘Unpacking Teaching and Learning

continues on page 15

Women, Science and Sustainable Development

Amb. (R) Fauzia Nasreen*

The 17 Sustainable Development Goals (SDGs) adopted in 2015 present a comprehensive approach to addressing the serious and existential challenges confronted by the world today. First identified in the UN High-Level Panel report titled Threats, Challenges and Dangers, the development paradigm has progressively received focused attention. The SDGs clearly reflect the aspirational desire and urgently needed solidarity for reversing the dangerous path on which the world finds itself today with respect to sustainable security and sustainable development. Human security is central to the interwoven goals claiming for collective actions by governments and financial corporations and business sectors. The implementation and achievement of the SDGs require effective and efficient governance mechanisms, nationally, regionally and internationally. Solidarity and cooperation alone can salvage humanity from the precipitous down slide. Without full participation and leadership of women, this endeavor becomes even more challenging especially in the current era of technological revolution.

The argument for participation of women and girls in science is becoming increasingly important given development and other challenges confronted by the world

today. In this context, the following three aspects are of significant relevance:

1. Women constitute 50 percent of the world population. Access to quality education and opportunities are vitally important for a robust and resilience socio-economic viability. Since we are witnessing momentous developments in science related fields labelled as STEMM (Science, Technology, Engineering, Mathematics and Medicine) has acquired critical importance. Neglecting the role and talent of women especially in science militates against the urgent need to address the perilous issues threatening world stability. Climate crisis, environmental degradation and its impact on human health, combating infectious diseases, food insecurity and water scarcity require sustainable STEMM-based solutions. This has been amply borne out by the experience of the Coronavirus pandemic and the speed with which the doctors, engineers, pharmacists and scientists, in general, developed the vaccine and other medical solutions. More trained people are needed for combating these threats and women participation will enhance the capabilities for getting innovative answers.
2. The technological transformations induced by what is being called the fourth industrial revolution is increasingly compelling societies to reorient and reshape their work force. Research, Development and Innovation have become indispensable for the progress of societies, countries and the regions across the globe. Information technology and Artificial Intelligence have revolutionized every aspect of human life and are redefining the working environment with various disruptions affecting individuals and countries in different ways. The education systems and institutions are challenged in redesigning their curricula and training programmes for research and commercialization of their products and innovations. In this effort, public-private partnership and synchronization of R&D with industry and business is key. The role of gender and empowerment of women for exploring new fields in STEMM will have salutary impact.
3. In the last few years, the world has changed dramatically as it has experienced unprecedented disruptions due to abnormal conditions and the hardships inflicted by the Coronavirus pandemic. After the severe infections and proliferation



* Ms. Fauzia Nasreen is former diplomat with an extensive experience as a practitioner of diplomacy, researcher, trainer and manager. Her areas of expertise are public policy, policy analysis, peace and conflict resolution and defence and strategic issues. Previously, she has served in various capacities in a number of missions. She has been ambassador of Pakistan to Nepal and Poland and High Commissioner for Australia. Ms. Nasreen has also been teaching as visiting faculty at prestigious higher education institutes of Pakistan. She has recently been looking after the SDGs wing of COMSATS Secretariat as Advisor. **Email: fnasreen2013@gmail.com**



of Coronavirus in the first year, urgent solutions were found giving rise to strategic foresight and targeted policy interventions. Different tracks of support and collaboration was seen with the geopolitical bent termed as vaccine diplomacy. Nevertheless, in some assessments disparities within and among nations increased, generating discontentment and enhancing vulnerabilities at various levels. In the lives of individuals, adjustments reorienting the routine work and daily lives enhanced dependence on the virtual world and more reliance on the digital world and online connections. E-commerce, e-education, telehealth and telemedicine substituted the physical world. This situation was paradoxical for women and girls. While solutions were available at their doorsteps, they were handicapped due to lack of training and access to the tools of the virtual world.

The critical question is how have the aforementioned factors impacted

the implementation of the SDGs and the aspirations for non-exclusive development creating peaceful societies as well as environmental and economic sustainability. SDG 4 clearly talks about inclusive and equitable quality education for all. The sustainability measures, be it fighting poverty, eradicating hunger, combating disease and climate change, food insecurity and agricultural productivity, technology and access to education, can be instrumental in reversing adverse trends. All these areas involve women as they are the ones that are affected most by them and they heavily rely on them in one way or another. Science does provide answers to these challenges and technically skilled equipped with the science-based education can transform their lives in a big way. Hence the case for inclusion of women in research and development is essential.

There is an urgent need to recognize and acknowledge the link between women and science, and women and sustainable development and growth and progress of societies. The research institutions, science

academies, science policies and strategies must reflect the desirability for visibility and exposure of women and their participation and leadership in the scientific fields. It is regrettable that most of the developing countries have not accorded due importance to the nexus between women participation and socio-economic health of their countries. In the regional context, although South Asia is one of the most populous regions of the world, the gender disparity exists which deprives women of opportunities for their educational and professional choices. The region enjoys enormous potential and the need exists for boosting result-oriented and targeted development that "leaves no one behind."

The 21st Century challenges of development, in particular, climate change and depletion of resources, such as fresh water and biodiversity erosion, together with population growth have exposed South Asia to multiple challenges. Regrettably, in the current environment of geopolitical competition and competing interests, the development challenges seem to have taken a backstage. The high moral approach, even though ostensible, towards SDGs and Global Development Agenda 2030 looks like a mirage. The time is for all stakeholders to revert back to the spirit that engineered the development goals and shun short sightedness for immediate gains. The planet and human life could be at a serious risk.

Let there be recommitment to the SDGs with public and private sectors playing their role, scientists refocusing on the development challenges to ward off catastrophes, such as dust storms, droughts and floods.

...continued from page 12

in Africa for Excellence' held in Accra. Speaking on the occasion, the President informed that Ghana's free education policy has been extended to include Technical and Vocational Education and Training (TVET), which is the need of the hour well into the 4th industrial revolution. Quoting the improving stats in school education the President also remarked that the Government of Ghana has prioritized Science, Technology, Engineering and Mathematics (STEM) educational programmes.



Image Source: <https://www.facebook.com/MBawumia>

President Nana Akufo-Addo was also awarded the 'Africa Peace Award' for his contributions to the growth and sustenance of peace in the West African sub-region and Africa as a whole. On behalf of the President, the Award was received by the Vice President, H.E. Dr. Mahamudu Bawumia on 4th May 2022, at Jubilee House, Accra (ModernGhana.com; 5th May 2022).

Pakistan Develops its First Truly Indigenous Embedded Microprocessor

Pakistan's first truly indigenous embedded microprocessor, NTiny-E, has been developed and launched by one of the country's national universities (TheNews; 14th June 2022).

An announcement in this regard was made by Pro-Rector of the National University of Science and Technology

(NUST), Dr. Rizwan Riaz, on 13th June 2022. The microprocessor chip was designed by NUST School of Electrical Engineering and Computer Science (SEECs).

The project was completely designed in-house without relying on open-source cores and foreign partnerships as has been the practice, making NTiny-E a truly indigenous product. This pioneering development is expected to help develop the country's national semiconductor landscape.

The Gambian and Sierra Leonean Ministries to Collaborate in Education

On 15th June 2022, The Gambian Ministry of Higher Education, Research, Science and Technology and the Sierra Leonean Ministry of Technical and Higher Education, concluded the visit of the former's delegation with reaching a cooperative agreement (AllAfrica.com; 17th June 2022).

An MoU was signed by the two Ministers of the afore-mentioned Ministries at the end of the visit of a high-level delegation of The Gambia to Sierra Leone in June. The MoU aims to renew existing ties between Sierra Leone and The Gambia since colonial days and facilitate sharing of

resources and explore opportunities of cooperation in higher and tertiary education in various fields, especially technical and vocational education and training (TVET) and R&D.

Uganda contributes nearly \$10 million to South-South Cooperation project with FAO and China

Uganda is continuing its collaboration with Food and Agriculture Organization of the United Nations (FAO) and the Chinese government crop and animal production after completing two phases of a successful project. Uganda would be contributing nearly \$10 million in view of the enhanced yields from the first two phases. (African.Business.com; 24th June 2022).

Ugandan government will be contributing funds of \$9,623,703 through a Unilateral Trust Fund (UTF). China, through FAO China, will be adding \$2,389,138 for the Phase III under FAO-China South-South Cooperation (SSC) Programme Trust Fund.

Phase III will focus on integrated technology transfer base; high yielding schemes for rice and foxtail millet; livestock improvement programmes; and aquaculture value chain.



Image Source: <https://www.moherst.gov.gm/>

Scholarships/Fellowships for Member States by COMSATS' Centres of Excellence

Students from COMSATS' Member States are welcome to benefit from the following offers from COMSATS' Centres of Excellence:

- Hundred (100) scholarships for students/researchers for postgraduate studies at all campuses of COMSATS University Islamabad (CUI), Pakistan.
- Five (05) postdoctoral fellowships at the International Center for Chemical and Biological Science (ICCBS), Pakistan.
- Five (05) short-term postdoctoral fellowships at the National Research Centre (NRC), Egypt.
- Two (02) PhD scholarships at the Al-Farabi Kazakh National University (KazNU), Kazakhstan.
- Postgraduate scholarships and postdoctoral fellowships at International Centre for Climate and Environment Sciences (ICES) under PIFI Programme.
- Long-term (1-2 years) and short-term (less than 6 months) fellowships for foreign scholars for collaborative research at Tianjin Institute of Industrial Biotechnology (TIB), Chinese Academy of Sciences.

For further details on the scholarships, please visit www.comsats.org or write to farhan@comsats.org.

TWAS-CASAREP-NIAS Regional Workshop on Science Diplomacy

The TWAS Central and South Asia Regional Partner (TWAS-CASAREP) and TWAS invite applications for the regional training workshop on science diplomacy. The workshop will provide participants with insights into key issues in science diplomacy with a regional perspective, and aims to bring together young scientists and experts from the policymaking arena who are active in the areas of science, technology and innovation-related matters.

Young scientists and policymakers from South and Central Asia, as well as Science and Technology-Lagging Countries (STLC) from other regions, are welcome to participate.

Application deadline: 31st July 2022

Workshop dates: 12th – 16th September 2022

For details, visit: <https://twas.org/opportunity/call-applications-twas-casarep-nias-regional-workshop-science-diplomacy>

For any queries, please contact: sciencediplomacy@jncasr.ac.in.

COMSATS Network of Centres of Excellence



BCSIR-Bangladesh
www.bcsir.gov.bd



Embrapa Agrobiologia-Brazil
embrapa.br/agrobiologia



ICES-China
english.ices.ac.cn



TIB-China
english.tib.cas.cn



CIF-Colombia
www.cif.org.co



NRC-Egypt
www.nrc.sci.eg



UTG-The Gambia
www.utg.edu.gm



CSIR-Ghana
www.csir.org.gh



ITS-Indonesia
www.its.ac.id



IROST-Iran
www.irost.org



ICENS-Jamaica
www.icens.org



KazNU-Kazakhstan
www.kaznu.kz/en/



RSS-Jordan
www.rss.jo



ICCBS-Pakistan
www.iccs.edu



NMC-Nigeria
www.nmc.edu.org



CUI-Pakistan
www.comsats.edu.pk



AQU-Palestine
www.alquds.edu/en



UCAD-Senegal
www.ucad.sn



ITI-Sri Lanka
www.iti.lk/en



IRCC-Sudan
www.ircc.gov.sd



HIAST-Syria
www.hiast.edu.sy



TIRDO-Tanzania
www.tirido.or.tz



CERTe-Tunisia
www.certe.rnr.tn



TÜBİTAK-Türkiye
www.tubitak.gov.tr



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