



# COMSATS Newsletter

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

Issue 5, Volume 13

September - October 2021



Observances of two International Days, South-South Cooperation and Mental Health Day, were made by COMSATS with relevant organizations in Pakistan, Switzerland, New York, China, Italy, Thailand, Kenya and Morocco (Details on Page 5)

## Inside this Issue

- Highlights from COMSATS Secretariat 2
- Special Section:** International Observances, September-October 2021 5
- Some Activities of COMSATS' Centres of Excellence 9
- Article:** Solar Energy in Perspective of Cost and Commercial Aspects 15
- Development and S&T News from Member States and Beyond 17
- COMSATS' Brief and Announcements 20

**Patron:**  
Dr. Akhtar Nazir  
Executive Director COMSATS

**Editors:**  
Ms. Farhana Saleem  
Ms. Isra Mahmood  
Mr. Muhammad Adnan

**Designing & Development:**  
Mr. Imran Chaudhry

## From Editors' Desk

The world has seen a number of challenges throughout history. However, the nature of these challenges are resulting more and more due to man-made causes that could easily be related to over population, unsustainable development activities, and thoughtless interference in natural systems. A constant threat of Climate Change has been acknowledged for last few decades to be looming over the wellbeing of the planet. Other emerging issues in one form or the other are either caused, perpetuated or exacerbated by Climate Change; these include many health issues, frequent occurrences of natural disaster and extreme weather events, food and economic insecurity. While studies and investigation are needed to evidence it, but it is very likely that the spread and stay of COVID-19 pandemic may have also been adversely affected by Climate Change.

Scientists from all fields need to work concertedly to abate this global nuisance, and many of them already are. It is, therefore, no surprise that two of the three 2021 Nobel Prize for Physics recipients announced this October won it for their contribution to Climate Change. Syukuro Manabe and Klaus Hasselmann share the prize "for the physical modelling of Earth's climate, quantifying variability and reliably predicting global warming". It is encouraging to see Climate Change receiving due attention at all levels.

COMSATS' own activities during the reporting period included diplomatic engagements with Iraqi, Ghanaian and Kazakhstani officials; and participation in joint workshop of COMSATS' Centre in China. Two International observances on South-South Cooperation and Mental Health were also duly marked. With SDGs 17 and 3, respectively, also serving as guidelines, these activities also helped benefit from perspectives from COMSATS University Islamabad (CUI), Pakistan; United Nations Office for South-South Cooperation (UNOSSC), New York; South Centre, Geneva; Alliance of International Science Organizations (ANSO), Beijing; InterAcademy Partnership (IAP), Trieste; Network of African Science Academies (NASAC), Nairobi; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Bangkok; and Islamic World Educational, Scientific and Cultural Organization (ICESCO). We are thankful to these organizations for their invaluable contributions towards these events and causes these stood for.

COMSATS Secretariat welcomes two new members of COMSATS Coordinating Council from The Gambia and Nigeria and hope that the Council would benefit from their expertise and intellect to help advance its objectives. Also, reported in this issue are some interesting developments on scientific and technological fronts in COMSATS' member countries that can help inspire R&D in other developing countries.

We welcome ideas and feedback from the readers on the contents of this issue.

## HIGHLIGHTS FROM COMSATS SECRETARIAT

### Meetings with Diplomatic Missions in Islamabad

Diplomatic community of COMSATS' member states serve as an important means for implementation of the organization's programmes in respective countries as well as for coordination with state institutions and governmental bodies. Besides, engagement with diplomatic staff of non-member countries is also an important feature of COMSATS' international cooperation that helps strengthen cooperative ties in S&T areas for mutual gains.

During the reporting period, three such meetings were held where the visiting delegates were briefed on COMSATS as an intergovernmental organization working for international cooperation in S&T. Chaired by the Executive Director COMSATS, Dr. Akhtar Nazir, these meetings were attended by senior officials of COMSATS. Account of these meetings is as below:

#### **Mr. Suleiman Khalid, Deputy Head of Mission, Embassy of Iraq in Islamabad (8th September 2021)**

The Deputy Head of Mission was accompanied by his colleague from the Embassy, Mr. Asseel Al-Jomaily. During the meeting, Mr. Khalid expressed his Government's desire for reconciliation on the fronts of scientific, R&D, and academic collaboration. In this connection, he also shared details of cooperative measures being initiated with Pakistani government and academic institutions, such as Ministry of Foreign Affairs (MoFA), Government of Pakistan; and COMSATS University Islamabad (CUI) – a Centre of Excellence of COMSATS. Referring to a recent visit of the Iraqi Foreign Minister to Pakistan, Mr. Khalid informed that the Government of Iraq is working towards strengthening its international relations. It was agreed during the meeting that



the Executive Director COMSATS would extend offer of COMSATS' State Membership to the Government of Iraq and the Ambassador of Iraq to Pakistan (COMSATS' host country) would be requested to make vigorous efforts to pursue the matter with relevant authorities in Iraq.

Discussions during the meeting also led to the understanding that COMSATS Secretariat will support formalization of agreement between COMSATS University Islamabad, and the University of Baghdad, with a view to create twinning arrangements between the two leading academic institutions to support faculty and academic exchange besides other initiatives.

#### **H.E. Eric Owusu-Boateng, High Commissioner of Ghana to Pakistan (1st October 2021)**

Hon. High Commissioner of Ghana to Pakistan (Resident in Tehran) was accompanied by Mr. Omar Shahid Butt, Vice Consul General of Ghana in Pakistan, and Mr. Tahir Javed, Public Relations Officer at Ghanaian Consulate in Pakistan.

Subsequent to receiving a briefing on COMSATS' engagements with Ghana focusing on past and ongoing

collaboration with the Government as well as Ghanaian scientific institutions, H.E. Eric Owusu-Boateng applauded the contributions made by COMSATS towards S&T-led socio-economic development of the global South, particularly in African countries. He considered COMSATS a unique forum for the promotion of South-South scientific cooperation, and expressed satisfaction on the role being played by Ghana in this regard. He took keen interest in COMSATS' Scholarship and Fellowship Programme, and offered facilitation to ensure that Ghanaian students would benefit from these opportunities. The High Commissioner pledged to support and facilitate communication between COMSATS and Ghanaian authorities/institutions for future collaborative undertakings.

Mr. Omar Shahid Butt shared some of the planned activities of the Ghanaian Consulate in Pakistan, and discussed possible participation of COMSATS in the same. Other matters discussed during the meeting included: Ghana's annual membership contribution to COMSATS; possibility of Ghana offering scholarships/fellowships to other member countries; and expansion of COMSATS' membership in African region.



**H.E. Mr. Yerzhan Kistafin, Ambassador of Kazakhstan to Pakistan (25th October 2021)**

During the discussion, Dr. Nazir and H.E. Mr. Kistafin exchanged views on expanding COMSATS-Kazakhstan cooperation, particularly in academia. Mr. Irfan Hayee, Deputy Director (Programmes) at COMSATS sought Ambassador's support for the expansion of COMSATS' membership in Central Asian region; improving interaction with COMSATS' focal point in Kazakhstan – the Ministry for Education and Science; and furthering work on COMSATS' scholarship programme and COMSATS' project proposal on Telehealth collaboration with Kazakhstan.

H.E. Mr. Kistafin expressed satisfaction on the active role played by COMSATS in supporting Kazakhstan's cooperation with other member countries of the organization.

His Excellency informed COMSATS' officials of the strong political liaison between Kazakhstan and Pakistan for purposeful international collaboration. In this regard, he urged COMSATS to help sustain high-level interactions with Kazakhstan.

The Ambassador suggested:

- Exploring collaboration with the Turkic Academy, an international organization founded in 2012 by Azerbaijan, Kazakhstan, Kyrgyzstan, and Turkey under the auspices of the Cooperation Council of Turkic Speaking States (Turkic Council) with the goal of coordinating scientific research on Turkic language, literature, culture, and history.
- Holding a seminar for diplomats of Central Asian countries, including Azerbaijan to discuss possibilities of collaboration and COMSATS' offer of membership.

**COMSATS-TIB Joint Workshop on "Technical Innovation in Traditional Plant Medicine" (13th October 2021)**

COMSATS in collaboration with its Centre of Excellence in China, the Tianjin Institute of Industrial Biotechnology (TIB), organized a virtual workshop on 'Technical Innovation in Traditional Plant Medicine', from the platform of COMSATS Joint Centre for Industrial Biotechnology (CCIB), on 13th October 2021. With physical and virtual participation (at CCIB/TIB and COMSATS Secretariat) of over 60 scientists/officials belonging to 13 Member States of COMSATS, the webinar covered talks by experts from China, Kazakhstan, and Pakistan.

During the inaugural, Prof. Dr. Jibin Sun, Director of CCIB and Deputy Director-General of TIB, stated that medicinal plants are one of the oldest means for cure, prevention and mitigation of diseases. Many natural products from plants provide great pharmacological benefits and are major sources for discovery of new drugs.

Speaking on the occasion, Executive Director COMSATS, Dr. Akhtar Nazir, noted that COVID-19 pandemic has





resulted in an unprecedented health and economic crises worldwide, and it is a matter of great urgency to reflect upon the situation and enhance global cooperation and support in the fields of science and technology, particularly biotechnology and traditional plant medicine for combating COVID-19 and such outbreaks in the future.

During his keynote speech titled “Traditional Chinese and Unani Medicine – Nexus for Human Beings”, Prof. M. Iqbal Choudhary, Director International Center for Chemical and Biological Sciences (ICCBS), Pakistan, delineated the widening gap in the healthcare systems of developed and developing countries. Some major challenges in herbal medicine as highlighted by Prof. Iqbal included: know-how gap; inconsistency; lack of understanding of the biomarkers; chemical vs bioactivity standardization issues; and lack of credible clinical evidence. He recommended following measures for strengthening traditional medicine sector: (i) documentation and compilation of Pharmacopia to serve as an important resource for government agencies, scientists, industry, practitioners, and patients; (ii) development and networking of human resource related to traditional medicine; and (iii) registration and marketing of

traditional medicines.

Discussing the phytochemical investigation of medicinal plants, Prof. Janar Jenis, Director of the Research Center for Medicinal Plants of Al-Farabi Kazakh National University (KazNU), Kazakhstan, informed about the work being done by the research centre for medicinal plants at Al-Farabi KazNU and touched upon medicinal plant resources in Kazakhstan.

Prof. Meng Wang, from TIB, China, highlighted the importance of the discovery of bioactive tri-terpenoids biosynthetic pathway of mushrooms. He informed that *Ganoderma lucidum* is one of the famous traditional mushrooms in East Asia and occupies the large market in healthcare industry. He shed light on biosynthesis pathways of Genoderic acids as well as highlighted efforts being made for its improvement.

Prof. Huifeng Jiang TIB, China, in his presentation, covered various topics related to traditional medicinal plants, including: biosynthesis of natural products; genome sequencing in plants; decoding taxol biosynthesis; coexpressional analysis of taxol biosynthesis genes; diosgenin and its synthetic pathways; and biological

activity assay of polydatin.

Prof. Jingwen Zhou Jiangnan University, China, in his presentation, titled ‘Towards the Customized Production of Flavonoids in Microorganisms’, discussed gene and pathway mining targeting the cellular optimization of microorganisms to produce flavonoids and its biotransform into high value products through sequential enzymatic activities.

After technical presentations, discussions took place between participants and subject experts during which emphasis was laid on creating linkages and synergies to benefit from the technical offers made at the workshop. Dr. Muhammad Ali from COMSATS University Islamabad (CUI), Pakistan, suggested seeking funding for joint projects from international donors on narrowed down research topics. On the occasion, Prof. Maliheh Safavi from the Iranian Research Organization for Science and Technology (IROST), Iran, offered collaboration in new biotech compounds from natural resources. Prof. Farzana Shaheen from ICCBS, Pakistan, also suggested documentation of the traditional medicine; organization of more of such events for exchange of information; and defining of effective funding mechanisms.

## SPECIAL SECTION: INTERNATIONAL OBSERVANCES, SEPTEMBER-OCTOBER 2021

As part of its efforts to aid international development initiatives, refine global narrative on cooperation to address common challenges, and support major international causes, COMSATS marks international observances through various effective engagements. These observances and their intellectual outputs also aide COMSATS' efforts for SDGs, and diplomacy and advocacy of key global issues. This issue covers two such observances through event reports on South-South Cooperation Day and Mental Health Day from COMSATS' Programmes and Telehealth desks.

### United Nations Day for South-South Cooperation

To celebrate United Nations Day for South-South Cooperation (12th September 2021), COMSATS organized a webinar entitled "South-South Cooperation: Creating Headways for Post-Pandemic Inclusive Recovery", on 21st September 2021. Joined by notable speakers from United Nations Office for South-South Cooperation (UNOSSC), New York; South Centre, Geneva; Alliance of International Science Organizations (ANSO), Beijing; InterAcademy Partnership (IAP), Trieste; Network of African Science Academies (NASAC), Nairobi; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Bangkok; and the Islamic World Educational, Scientific and Cultural Organization (ICESCO), Rabat, the webinar had virtual gathering of over 90 from 28 countries. Overall, participation included individuals from Bangladesh, Benin, Canada, China, Egypt, France, Ghana, The Gambia, Italy, Jordan, Kazakhstan, Kenya, Morocco, Nigeria, Palestine, Pakistan, Sri Lanka, Sudan, Syria, Switzerland, Tanzania, Thailand, Tunisia, Turkey, Uganda, USA, Venezuela, and Yemen.



Opening the session, Executive Director COMSATS, Dr. Akhtar Nazir (Federal Secretary, Ministry of Science and Technology, Government of Pakistan), opined that resolution of contemporary socio-economic challenges requires enhanced global cooperation, particularly, South-South and Triangular Cooperation, in various sectors. He considered COMSATS' resolve to work with like-minded institutions for inclusive recovery from the Pandemic.

In his video message for the occasion, Dr. Adel Abdellatif, Director, UNOSSC, commended COMSATS' role in championing South-South Cooperation. Dr. Abdellatif deemed South-South Cooperation an effective tool to enhance opportunities and generate solutions in this digital era. He strongly urged the participants to make full use of 'South-South Galaxy', a platform developed by UNOSSC as a digital global knowledge sharing and partnership brokering forum, providing best practices for South-South cooperation; as well as connecting solution-providers with solutions-seekers and facilitating cross-border collaborations.

In his talk on the 'Role of South-South

Cooperation in the Current Pandemic: Lessons for an Inclusive Recovery', Dr. Carlos Maria Correa, Executive Director, South Centre, highlighted the importance of S&T in addressing various human needs and socio-economic challenges. He considered insufficient technology-sharing a failure of multi-lateral system amidst COVID-19 crisis. Dr. Correa stressed upon the need of having a policy framework to help translate S&T-led progress at global level.

Prof. Ai Likun, Assistant Executive Director, ANSO, in her presentation shared the role of ANSO in promoting cooperation in science in the global South. Prof. Likun, inter alia, shared ANSO's efforts in combating COVID-19 crisis that culminated in initiation of various research-based and scientific projects in collaboration with regional and international partners. She was also of the view that achieving SDGs by 2030 relies greatly on recovery and progress in the global South for which South-South Cooperation is essential. Speaker from IAP, Dr. Peter McGrath, discussed the role of Academies of Science in leveraging South-South Cooperation for global development. He noted some strategic priorities



of IAP and also mentioned various programmes being run by IAP in collaboration with global partners to help achieve organizational mission. These programmes, he mentioned, are promoting the importance of science in research and education, as well as empowering regional networks of academies to provide independent, evidence-based and authoritative advice on global, regional and national issues.

President of NASAC, Prof. Mahouton N. Hounkonnou, shared views on promoting South-South cooperation through networking of Science Academies. He further mentioned STEM

education as one of the core missions of NASAC which he deemed vital for the achievement of SDGs in Africa. Prof. Hounkonnou sought COMSATS' support in promoting the voice of science to be heard by decision-makers and policymakers in the African continent and beyond.

Dr. M. Sharif, Advisor Science and Technology, ICESCO, shared his organization's experience in implementing various Science and Technology programmes during COVID-19. Some projects and programmes launched during the Pandemic as mentioned by Dr. Sharif included: construction of water

reservoirs; setting-up of small units to produce sanitation and hygiene products; organization of online lectures in disaster management and water security; and capacity-building of young scientists, among others.

Speaking on the occasion, Mr. Adnan H. Aliani, Director, Strategy and Programme Management Division, UNESCAP, regarded South-South and Triangular cooperation as ESCAP's prescribed modus operandi. He considered reinvigoration of regional and sub-regional multilateral mechanisms important for post-COVID-19 recovery. To this effect, he shared the targets of UNESCAP that



include greater investment in social protection systems; re-alignment of financial and economic priorities in line with 2030 Agenda for Sustainable Development; building resilient supply chains; increasing cross-border connectivity; and restoring ecosystem balance.

During the Q&A session, interesting discussions took place between learned speakers and participants that touched upon: role of South-South cooperation for inclusive peace; means and mechanisms to strengthen science advisory; role of digital platforms in enhancing South-South cooperation; effectiveness of South-South cooperation as compared to Triangular cooperation; and budgeting for disaster risk reduction and crisis management.

It was agreed that poverty alleviation needs to remain a top priority amid the arising global challenges, ensuring food and water security, and disaster preparedness and management, that would help build resilience of developing countries and ensure their better recovery from the pandemic. Better integration of new technologies, big data, and AI could help global South's recovery from COVID-19 pandemic. Gap between scientists and policy makers needs to be bridged through better communication on important development subjects, such as SDGs. Academies of sciences have an important role to play in this respect and their networking and collaboration with relevant stakeholders could help greatly in this regard. The



complementarity of South-South cooperation to Triangular cooperation was highlighted, and effective use of the former was strongly advocated.

Closing the session, Dr. Nazir extended gratitude to all the speakers for their informative talks and presentations highlighting best practices, solutions and lessons learnt from the pandemic. He remarked that collaborative and integrated approach will be the need of the post-COVID-19 world.

### World Mental Health Day

To observe this year's World Mental Health Day, COMSATS in collaboration with its Centre of Excellence, COMSATS University Islamabad (CUI), Islamabad, organized a Workshop on "Engaging University Faculty for Mental Health Wellbeing of Youth", on 14th October 2021. Held at CUI, Islamabad, the Workshop had physical and virtual participation of 30 faculty members belonging to various fields of arts and science. The subject event along with the overarching theme of mental health and wellbeing of youth also had the backdrop of Sustainable Development

Goals 3 (Good Health and Wellbeing) and 4 (Quality Education).

Opening the event, Dr. Azeema Fareed, Pr. Medical Officer and Focal Person COMSATS Telehealth Project, underscored the significance of the subject and the need for creating awareness about it among people of all age groups. She also highlighted COMSATS' efforts and contribution towards the realization of 2030 Global Agenda.

In his welcome address on the occasion, Registrar CUI, Dr. Sajjad A. Madani, highlighted a number of challenges for youth arising from the digital age. He hoped that the current event will help identify and present remedial measures to combat such challenges.

The first speaker for the technical session, Dr. Aisha Kashif, Counselor, Psychologist United Nations (UN), Islamabad, acquainted the participants with spectrum of the term "mental health" and briefly shared factors affecting mental health and peace. She shed light on the myths and stigmas associated with mental illnesses. She





was of the view that the ability to manage day-to-day stress varies from an individual to individual. Discussing stress-related issues in university students, she stated that university environment presents a distinct set of challenges to students and could be a factor determining their mental health.

Dr. Noreen Akhter, Deputy Director, Sr. Psychologist, National University of Sciences & Technology (NUST), Islamabad, focused on the warning signs and identification of at-risk cases. She apprised the participants of the stigmas related to mental illnesses which may trigger self-harm tendencies and suicidal thoughts in patients. Dr. Akhter considered lack of connection between parents/teachers and youth and unhealthy use of social media and digital tools some notable issues affecting the youth's mental well-being.

The last speaker, Dr. Saima Kalsoom, Psychologist, National Defence University (NDU), Islamabad, highlighted teachers' role in contributing to students' mental health and peace. She

considered teachers' psycho-education literacy vital and urged university policy makers to provide favorable environment to faculty for them to effectively manage their relationship with young minds.

During the Q&A session, topics such as parents' education, consequences of social media, and awareness on sexual harassment and other sensitive issues were deliberated upon. Discussing these issues, guest speakers added that lack of awareness regarding child mental health issues and absence of parent-child connection are root causes of increasing trend in mental illnesses in young generation.

The Chief Guest for the event, Dr. Akhtar Nazir, incumbent Executive Director COMSATS, and Federal Secretary, Ministry of Science and Technology, Government of Pakistan, appreciated the subject event organized by COMSATS Secretariat Telehealth Desk and COMSATS University Islamabad. In the light of key global stats on mental health of

youth, Dr. Nazir considered it important to give this field of medical science due importance for ensuring healthier societies. He further emphasized the need for keeping debates open on this and other health issues through awareness events, which he deemed an important step forward for relevant remedial measures at societal and national levels.

Delivering his vote of thanks at the closing ceremony, Prof. Dr. Tabassum Afzal, Rector COMSATS University Islamabad (CUI), expressed concern over the increased stress and other mental health related issues since the onset of COVID-19. Considering cultural and societal norms an important factor in dealing with mental illnesses, Prof. Afzal cited examples of stress management from the Islamic history and urged the faculty to take initiatives for the wellbeing of youth's mental health. He also appreciated the long-standing COMSATS – CUI relationship and extended gratitude to organizers, participants, and other distinguished guests.



## SOME ACTIVITIES OF COMSATS' CENTRES OF EXCELLENCE

### TÜBİTAK-Turkey Develops Robot Eye to Detect Gas Leakages in Natural Gas Pipes

TUBITAK Rail Transport Technologies Institute (RUTE), Turkey, has developed an In-Pipe Inspection Robot dubbed "Robot Eye" to detect leaks in natural gas line pipes. Equipped with 900 sensors, the robot has been developed under the project initiated by TUBITAK for Istanbul Gas and Natural Gas Distribution Inc. (İGDAŞ) in 2017.

Turkey is the second country after the USA to develop its own inspection robot that can also map and inform whether the pipes can be used after the earthquake and whether they are displaced or not.



### TÜBİTAK MAM-Turkey Develops Hydrodynamic Cavitation Reactor

The Environment and Cleaner Production Institute (ÇTÜE) of TÜBİTAK Marmara Research Center (MAM), Turkey, and Bioflora company have jointly developed a National Cavitation Reactor to ensure the management of treatment sludge within the scope of "Zero Waste" approach.

In a wastewater treatment plant, the

disposal cost of the treatment sludge formed as a result of the process constitutes 50% - 60% of the plant operating cost. Therefore, it has become a great challenge today to save a significant amount of energy and land by reducing the treatment sludge. In general, effective decomposition and dewatering of treatment sludge is quite a difficult process, and most of the energy in the sludge is sent to disposal without being used.

With the developed cavitation reactor, the energy component of the treatment sludge is increased and the amount of bio-solid that needs to be disposed is reduced by ensuring the fragmentation of particles with the local high temperature and pressure values obtained, without causing any negative effects on the environment. It also makes it possible to remove organic micro-pollutants from the treatment sludge.

### Solutions for Thermal Management of Electronics Developed by TÜBİTAK MAM-Turkey

Institute of Chemical Technology (KTE) of TÜBİTAK Marmara Research Center, Turkey, has been developing a production technology for new generation polymer nanocomposites with high thermal conductivity and low electrical resistance for solving thermal management problems in the field of electronics/microelectronics.

Thermal interface materials are high thermal conductivity materials that are suitable for rough joining surfaces and used in the form of grease, phase change materials, adhesives and thermal films. The developed thermally conductive nanocomposites can be used as electronic/microelectronic components in heat sinks, polymer-based electronic circuits, cooling

systems, LED lamps, etc. The Thermal Interface Material can be used in power units, cooling systems, thermal management systems, LCD TVs, wireless devices, LEDs and telecommunication devices.

### Scientists at TIB-China Synthesize Artificial Starch from CO<sub>2</sub>

Starch is the major component of grain as well as an important industrial raw material. At present, it is mainly produced by crops such as maize by fixing carbon dioxide (CO<sub>2</sub>) through photosynthesis. This process involves about 60 biochemical reactions as well as complex physiological regulation. The theoretical energy conversion efficiency of this process is only about 2%.

To help overcome this challenge, scientists at the Tianjin Institute of Industrial Biotechnology (TIB) of the Chinese Academy of Sciences (CAS), China, have designed a de novo route for artificial starch synthesis from carbon dioxide (CO<sub>2</sub>) for the first time. The artificial route can produce starch from CO<sub>2</sub> with an efficiency 8.5-fold higher than starch biosynthesis in maize providing a new scientific basis for creating biological systems with unprecedented functions.

In addition, it would also help avoid the negative environmental impact of pesticides and fertilizers, improve human food security, facilitate a carbon-neutral bio-economy, and eventually promote the formation of a sustainable bio-based society.

### RSS-Jordan Signs MoU with ICTP in Synchrotron Applications

The Royal Scientific Society (RSS)

of Jordan in partnership with the Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) has virtually signed a Memorandum of Understanding with the Abdus Salam International Centre for Theoretical Physics (ICTP) to promote scientific research and education, training and communication in Jordan and the Middle East and North Africa (MENA) region.

The MoU was signed by HRH Princess Sumaya bint El Hassan, President of RSS; Mr. Khaled Toukan, Director of SESAME; and Dr. Atish Dabholkar, Director of ICTP.

Under this Agreement, RSS will create a partnership with researchers in Jordan and facilitate their training opportunities at SESAME and the ICTP. The MoU will also provide scholarships for students to work with experts at SESAME synchrotron in the Allan area in Salt and the Elettra synchrotron in Trieste, Italy.

RSS has also signed an MoU with the ICTP, which focuses on knowledge sharing and scientific collaboration in the fields of Earth System Physics (ESP), High-Performance Computing (HPC) and climate modelling.

## Water Quality Expert at RSS- Jordan Wins Global Award for Change Makers 2021

Eng. Tharwh Qutaish, Manager of Environmental Monitoring & Research Central Unit at RSS, Jordan, bagged a gold medal in the Global Award for Change Makers 2021 in the water and environment area. Engr. Qutaish received her award held during a special ceremony at the "11th International Conference on Women in Leadership and Entrepreneurship: The Power of Influence towards Leading Change - Together to Global" held in September in Turkey.



Engr. Qutaish won the Global Award through a competition organized by the Center for Change Makers for Development. She was selected out of more than 600 national and Arab candidates to compete for the best change-makers in the Arab world for the media, academic, economic, political, medical, cultural, social, artistic, sports, scientific and human rights and crafts, and innovation sectors.

## AQU-Palestine Enhances Cooperation with Germany

Prof. Imad Abu Kishek, President of Al-Quds University (AQU), Palestine, held a meeting with the delegation of the German Representative Office in Ramallah, Palestine, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), on 4th October 2021.

During the meeting, the two sides discussed the academic partnerships between AQU and the German government, most notably in the Dual Studies programme.

Highlighting the importance of the programme in supporting the Palestinian educational system, Prof. Abu Kishek stated that AQU encourages research and seeks to promote field training to meet the students' needs after graduation. The German delegation acknowledged the tremendous achievements of the Dual Studies and thanked AQU for the ongoing mutual cooperation and ensuring the success of the programme at all levels despite the challenges posed by the COVID-19 pandemic.



The Dual Studies Programme was launched at Al-Quds University in 2015 with the support of the German government. The programme is the first of its kind in Palestine and the Middle East. The program combines theory with practice to develop the professional level of the Palestinian youth and bridge the gap between the academic educational outcomes and the demands of the Palestinian labor market. The programme offers students a unique opportunity to simultaneously study and acquire practical experience at specialized Palestinian companies throughout their undergraduate studies.



### KazNU-Kazakhstan Expands Cooperation in Academics

During the reporting period, Al-Farabi Kazakh National University (KazNU), Kazakhstan, explored cooperation avenues with academic institutions of Turkey, Pakistan, and USA in a number of domains. These include:

**Istanbul University, Cerrahpaşa-Turkey:** The two sides discussed avenues of cooperation in the field of the medical sciences. Joint scientific and innovative developments in the field of biomedicine, academic mobility of students, teachers, researchers, as well as joint development of educational programs for undergraduates and doctoral students were also discussed during the meeting.

**Lehigh University, Pennsylvania-USA:** The parties exchanged views on the possibilities of establishing joint research laboratories, conducting research in contemporary areas of science and technology, social and humanitarian problems, as well as exchange of publications and information materials. As the Global Hub of the UN Academic Impact Program on Sustainability, KazNU offered Lehigh University a partnership

offer for implementation of educational programmes and research projects under Sustainable Development Goals (SDGs).

**National University of Modern Languages (NUML), Islamabad-Pakistan:** The two Universities agreed to sign a Memorandum of Cooperation for academic mobility, advanced training courses for the teaching staff, joint research projects, textbooks translation and development of Kazakh-Urdu dictionary.

**International Islamic University (IIUI), Islamabad-Pakistan:** The parties shared readiness to cooperate in such scientific areas as religious studies, cultural studies and Islamic studies, as well as to conduct joint research, conferences and seminars, and exchange of students and teaching staff.

In addition to the above, meetings with following representatives of foreign missions in Kazakhstan were held with a view to foster bilateral cooperation in the field of science and education.

**H.E. Mr. Marco Alberti, Ambassador of Italy to Kazakhstan:** It was hoped that KazNU's cooperation with leading universities and research centers of Italy

would continue and expand to include training of highly qualified personnel, research and development in the field of nanotechnology and materials, archeology, as well as joint scientific and innovative projects.

**Mr. Peace Kennedy, Foreign Policy Advisor at the Embassy of South Africa in Kazakhstan:** During the meeting, the Advisor extended proposals for the transformation of one of the best universities of South Africa into a sister university of Al-Farabi KazNU, organization of a series of master classes, and seminars on the implementation of Square Kilometer Array (SKA) project to create the world's largest radio interferometer.

**Mr. Iman Prarahadian Khavid, Minister-Counselor, Embassy of Indonesia in Kazakhstan:** The need to hold joint offline and online conferences, seminars and symposia to share best practices for development of science and introduction of advanced teaching methods was emphasized during the meeting. Moreover, importance of publishing materials and exchanging experience in the field of higher education, organizing joint research in priority areas of science and innovation was also discussed.

## CUI-Pakistan Inks MoU with Sri Lankan KDU in Advanced Biomaterial Research

COMSATS University Islamabad (CUI), Pakistan, has signed a Document of Understanding with the General Sir John Kotelawala Defense University (KDU) of Sri Lanka in the area of advanced biomaterial research. Signed in an online ceremony by Rector CUI, Prof. Dr. Muhammad Tabassum Afzal, and Vice Chancellor KDU, Major General Milinda Peiris, the Agreement involves cooperation between the Interdisciplinary Research Centre in Biomedical Materials (IRCBM) of CUI and KDU on respective national regulations on safety and security of sensitive materials, goods, technologies and equipment.

Speaking on the occasion, Prof. Afzal considered the partnership important for the development of products, such as synthetic skin substitute, wound dressings for foot ulcer patients, artificial bone fillers, disease monitoring and diagnostic devices. Major General Milinda Peiris stated that the partnership would pave way for activities having shared interests of CUI and KDU, such as biomaterials, tissue engineering, regenerative medicine, sensors and biosensors and allied fields.

In addition, both universities will explore possibility of exchange of programs for students, faculty members and scientists, joint supervision of PhD students, mutual organization of lectures, conferences, symposia and training programmes.

## Ranking of CUI-Pakistan

According to the recent ranking of the TIMES Higher Education (THE) subject universities rankings 2022, CUI has secured a place in the category 501-600 in Physical Sciences and 601-800 in

Life Sciences. Besides, the University has been ranked at place 2 among Chemistry Departments of all Pakistani Universities according to QS World University Ranking 2021.

## UCAD-Senegal Reinforces Cooperation with Turkey

A delegation from the Cheikh Anta Diop University of Dakar (UCAD), Senegal, visited the Republic of Turkey, from September 25th to October 3rd 2021. Led by the Dean of Odonto-Stomatology Faculty of Medicine Pharmacy (FMPOS), the delegation comprised of deans of Faculty of Letters and Human Sciences (FLSH), Faculty of Science and Technology (FST), Faculty of Legal and Political Sciences (FSJP), Director of the Higher Polytechnic School (ESP) and the Secretary General.

The aim of the visit was to foster existing cooperation and expand UCAD's field of cooperation in higher education and research. The delegates visited the R&D facilities of several Turkish universities, as well as Turkish Aerospace – a company specializing in the manufacture of armaments, satellites, and drones. During the meetings held at different universities, opportunities of joint research and student exchange were explored.

## ICCBS-Pakistan to Establish Medicinal Plants Research Lab in Sudan

The International Center for Chemical and Biological Sciences (ICCBS), Pakistan, has signed a Memorandum of Understanding (MoU) with the National Center for Research (NCR), Sudan, for the establishment of a medicinal plants research laboratory at the Centre.

Signed in an online meeting by Prof. Dr. M. Iqbal Choudhary, Director of ICCBS, and Prof. Dr. Zeinab Abdelrahim, Director General of NCR, the MoU will facilitate collaboration between the institutions of the two countries relating to faculty exchange, capacity-building of human resource, as well as share of experience and expertise in the field of medicinal plants research, industrialization and marketing.

The two sides will also organize joint conferences, workshops and training courses to facilitate networking among scientists of Pakistan and Sudan.

A research institute working under the Sudanese Ministry of Science and Communications, NCR consists of 13 research divisions working in different areas of science.



## Director ICCBS-Pakistan Receives Mustafa Prize in Bio-Organic Chemistry

Prof. Dr. M. Iqbal Choudhary, Director of ICCBS, Pakistan, has been awarded 2021 Mustafa Prize for his services in the field of bio-organic chemistry. Prof. Choudhary is one of the five scientists to receive this year's Award in their respective fields of study; the other four belong to Iran, Bangladesh, Lebanon, and Morocco.

Mustafa Prize is a prestigious science and technology award granted biennially to the top researchers and scientists from the Islamic world in four categories. The prize was established in 2012 as a symbol of scientific excellence at the international level, and is regarded as the Nobel Prize of the Muslim world.

## CSIR-Ghana Introduces SAWAH Technology to Boost Rice Production

Currently, Ghana imports more than \$400 million worth of rice annually to meet the local demands. Moreover, multiple constraints, including poor land management, inappropriate water management, ineffective fertilizer management, post-harvest losses and rainfall variability due to climate change lead to low grain yield.

To help overcome these challenges and to increase local rice production and reduce dependency on rice importation, the Soil Research Institute of the Council for Scientific and Industrial Research (CSIR), Ghana, has introduced a novel SAWAH technology for the integrated management of land, water and fertilizer. The Institute is also educating farmers on this new technology to increase rice yields and cultivation in the country.



## CSIR-Ghana Launches Project to Boost Climate Smart Agriculture

The Crop Research Institute of the Council for Scientific and Industrial Research (CSIR), Ghana, in collaboration with the Centre for Agriculture Biosciences International (CABI), Esoko, International Water Management Institute and several other organizations has launched a climate-smart agriculture programme to enhance Ghana's resilience in agriculture and food systems in the face of climate change.

The three-year project dubbed "Accelerating Impact of CGIAR Climate Research for Africa-Ghana Cluster (AICCRA)" is funded by the World Bank and led by the International Institute of Tropical Agriculture (IITA), Nigeria.

The entire project is structured around three main components: knowledge generation and sharing for effective climate-informed services, strengthening public-private partnerships for delivery, and supporting uptake of climate-smart agriculture innovations through piloting.

The project would focus on bridging the gap between research institutes that produce improved technologies and the development organisations that

promote the adoption of the improved technologies.

## UTG-The Gambia Holds Conference on COVID-19 Pandemic

The University of The Gambia (UTG), The Gambia, held its first International Conference themed on "COVID-19 Pandemic- Economics, Health and Education: Impacts and Recovery", from 27th to 28th October 2021.

Opening the Conference, the Director of the UTG's Research and Consultancy Directorate, Dr. Muhammed Lamin Sanyang, considered the event an important platform for networking and sharing of ideas on how to deal with the impact of COVID-19.

Speaking at the inaugural, Prof. Pierre Gomez, Acting Vice Chancellor of the University, was hopeful that discussions of the two-day conference would guide national policies concerning COVID-19. He added that stakeholder collaboration during the Conference could lead to joint research activities and ensure that every policy is guided by sound research. Other speakers of the inaugural included representatives from the Ministry of Higher Education and Scientific Research, and the Ministry of Health of Sudan.

## PROFILE OF PROF. PROMISE MEBINE, DIRECTOR/CHIEF EXECUTIVE, NATIONAL MATHEMATICAL CENTRE (NMC), ABUJA, NIGERIA

Prof. Promise Mebine is the Director/Chief Executive of the National Mathematical Centre (NMC), Abuja, Nigeria, a Centre of Excellence in Mathematical Sciences and the Lead Centre in Mathematical Modeling. An Erudite Professor of Mathematics, Prof. Mebine has previously been the Rector of Bayelsa State Polytechnic, Aleibiri, Nigeria. He had also held other notable positions at the institute, including: Member, Committee on Accreditation Matters of Tertiary Institutions in Bayelsa State, Nigeria; Member, Committee on Appointment of PhD, MSc and BSc Holders, Bayelsa State, Nigeria; and Board Member, Bayelsa State Science and Technology Education Board (BYSSTEB).

Born in 1967, Prof. Mebine earned his first degree from River State University of Science and Technology (also known as River State University (RSU) Porthacourt), Nigeria, in 1997, graduating with a BSc (Hons) Degree in Pure and Applied Mathematics. He stood out as best graduating student in the Department of Mathematics as well as in the Faculty of Science of the University for the 1997 academic session. He continued his education in the same University and graduated with a MSc Degree in Applied Theoretical Physics in 2002. Prof. Mebine bagged his Ph.D. in Applied Mathematics at the Loughborough University, United Kingdom, in 2006.

Prof. Mebine's career started as a Graduate Assistant in the Department of Mathematics at River State University of Science and Technology, Porthacourt, Nigeria. He later joined Department of Mathematics/Computer Science at the Niger Delta University (NDU), Wilberforce Island, Nigeria where he was majorly involved in teaching, research and coordination of scientific activities, both at the Undergraduate



and Postgraduate level. He also held several University appointments as External Examiner for Postgraduate (MSc and PhD) Degree Programmes in Applied Mathematics, Statistics, and Applied Theoretical Physics.

Prof. Mebine's research work has helped find solutions to contemporary problems. Research interests of Professor Mebine pertain to:

- Computation and optimization of mixing and chemical reactions in real river flows emphasis on "Minimum Environmental Impact Discharging";
- Problems of MHD, free convection flows, radiative heat and mass transfer effects;
- Problems of Linear/Nonlinear Partial and Ordinary Differential Equations of physical significance with approximation, perturbation and asymptotic analyses solution methods.

He has made great contributions in these areas of research which have also resulted in a number of scientific publications in popular scientific journals, conference proceedings and technical reports. He has 42 journal articles, 12 conference papers, and 3 books to his credit.

Prof. Mebine is also a member of Nigerian Mathematical Society (NMS), Mathematical Association of Nigeria

(MAN), Nigerian Association of Mathematical Physics (NAMP), Nigerian Computer Society (NCS), International Chartered World Learned Society, Chartered Institute of Educational Management & Administration and Fellow, Chartered Institute of Records and Management, among others.

### Contact details:

#### Professor Promise Mebine

Director/Chief Executive  
National Mathematical Centre, Abuja  
www.nmcabuja.org  
Tel: (+234) 805 3329 308, 813 8012 018  
Email: mebinep@yahoo.com

### Change in Leadership of UTG-The Gambia

COMSATS welcomes and congratulates Prof. Pierre Gomez on assuming charge as the Acting Vice Chancellor of the University of the Gambia, The Gambia. The Organization also acknowledges with gratitude the services and efforts of the outgoing Vice Chancellor, Dr. Faqir Muhammad Anjum, towards COMSATS Coordinating Council's objectives.



# SOLAR ENERGY IN PERSPECTIVE OF COST AND COMMERCIAL ASPECTS

by Ms. Aafia Sarosh\*

How can we produce clean, safe, sustainable energy supplies for the world during the twenty-first century with increasing economic challenges and rising populations? There is a growing consensus that renewable energy sources will be a very important part of the answer, believes Godfrey Boyle (1996). The environmentalists and industrialists who are equally concerned about the exponential growth in human population hail Renewable Energy as the foundation of future strategies on energy supplies, while others have voiced profound scepticism. In latest years, this sharp division has faded: outright rejection has been mitigated as the technologies have upgraded but the contribution of renewable energy remains small. The need for renewable energy became far more intense with escalating oil prices and worsening global climate conditions.

In recent decades, renewable energy is being considered as a revolutionary solution to global energy issues, something that can save the planet and ease its overall predicament. Naturally, every country in the world has been seeking new energy sources as alternative to fossil fuels. Out of the popular renewable energy resources, with their own advantages and limitations, sunlight is considered as world's largest energy resource. United States harnesses more energy from sunlight in less than forty minutes than it does from the fossil fuel that burns in a year (Thomas B. Johansson, 1993). However, the trick for all interested in tapping solar's full potential is to capture and store it.

The history of renewable energy is fascinating. It served the purpose for thousands of years before the discovery

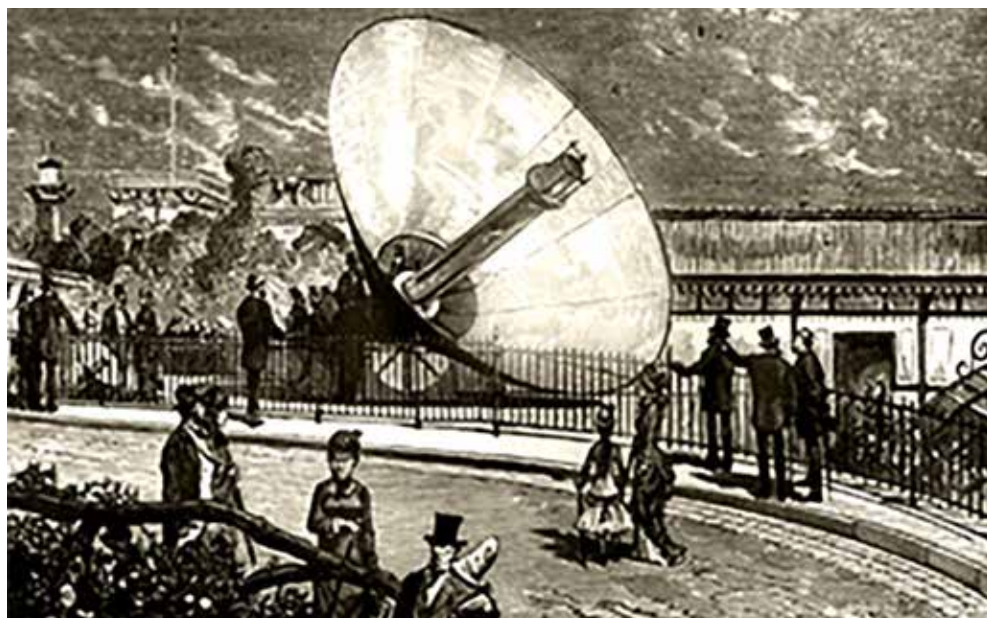


Figure 1: Augustin Mouchot's Solar Concentrator at the Universal Exhibition in Paris, 1878 (Generator, 2021)

and the mass drilling of oil during the industrial age, i.e., energy from fire. The solar technology dates back to 18th century when Augustin Mouchot invented the first solar oven in 1767 and his successful proof-of-concept designs obtained support from the French government to pursue full-time research. The early pioneers of solar thermal concentrators were Mouchot and Ericsson in the 19th century. Ericsson believed that solar power is ten times as expensive as coal, hence, until coal began to run out, solar power would not be economically feasible and there was no question that "fossil fuels would indeed run out someday". What we have used in around 150 years will take around 10,000,000 years to replenish and hence preparation is needed for a post-fossil fuel world now.

Simply put, solar power is the conversion of the energy from the sun into electricity. Many different arguments tend to be used in support

of developing solar energy as the major source of renewable energy around the world. Harnessing solar energy directly from sunlight involves the use of a different and more sophisticated technology called solar photovoltaics (PV) and with its development, it has been proved that electricity can be generated for a wide range of applications, scales, climates and geographic locations by using this technology. Solar thermal technology is another means to capture sun's heat and convert it into mechanical energy or use directly by a technology known as concentrated solar power.

With approximately 173,000 terawatts of solar energy continuously falling on Earth's surface, there is even more energy to meet the world's current energy demand of 15 terawatts per year. The Challenge, though, is collecting it in utilizable form. The amount of solar radiation received by the Earth is enormous, but for various reasons,

\* Generator, L. (2012, February 29). The 19th century solar engines of Augustin Mouchot, Abel Pifre, and John Ericsson. Land Art Generator. <https://landartgenerator.org/blagi/archives/2004>.

it cannot be directly substituted for other conventional energy sources. Assessment of the availability of solar radiation as an energy source depends on the geographical location, including local conditions, such as cloudiness, radiation flux, dependence on time and seasonal variation, etc. Furthermore, for designing and operating solar devices certain solar radiation data is needed.

Solar technology has not been used for big businesses for multiple reasons, a major one being the cost to produce the energy. The solar energy market is hampered by multiple barriers to adoption in the EU and worldwide. Although several studies debate that solar PV is mature enough to compete with conventional energy sources there are still barriers to adoption in both high-income and low-income economies. It is necessary that PV should include development of high-performance flat-plate PV and concentrator PV modules with efficiencies of 25% and 40%, respectively, to achieve the full market potential. Residential and commercial PV systems provide 27% more expensive electricity than that from utility-scale, ground-based PV systems. The market trend portrays that with an increase in competition the cost difference will decrease greatly. In the future, the residential PV systems would tend to become even cheaper than ground-mounted PV. Ernest J. Moniz (2011), the Director of the MIT Energy Initiative, states that the "Costs have come down very dramatically" for solar power, "but it's still not that cheap". The cost reductions are thought to result from manufacturing improvement and deploying as much solar electricity systems as possible from research and

development efforts and shows hope for this trend to continue. Now, as the era of cheap oil seems to end, the price instability raises valid concerns as does a substantial dependence on too few producing countries. Scarcity risks and volatile prices give an opportunity to offer vital reasons to reduce fossil fuels' consumption, but for many, the most imperative driver remains climate change mitigation.

Market expansion drives cost reductions and cost cuts expand niche markets, which set in motion a virtuous circle. Nothing indicates that this development would meet any limit soon, but the impetus still requires policy support for a few more years. The globally installed renewable energy capacity is booming but many problems regarding grid integration appear due to the variability and uncertainty in the output of renewable energy generation. Solar electricity is not necessarily as variable as the solar resource itself. Solar thermal electricity (STE) can use relatively cheap and very efficient thermal storage, which allows de-linking the time of sunshine collection and the time of generating electricity. In this decade, this characteristic is most likely to be used for shifting electricity generation to match peak demands, especially when they do not coincide with sunshine hours and are highly valued by grid operators, for producing electricity during peaks is always costlier. Progressively, storage will be used on a much larger scale to produce solar electricity during times of mid-peak or shoulder loads, or even base load. Analysis of such socio-economic factors and possible solutions to them can proceed along with progress in technical and scientific work on solar

devices.

Currently, solar electricity tops in projected share of 25% of global electricity generation by 2050, more than both wind power and hydro power. By contrast, most other renewables – with the possible exception of wind power – may meet some kind of intrinsic limits. If this is the case, in a carbon-lean world economy solar energy would continue to grow faster than any other energy resource long after 2050. Solar energy is particularly available in warm and sunny countries, where most of the growth – population, economy, and energy demand – will take place in this century. The difficult challenge faced by climate negotiators is to persuade countries to adopt objectives that are more ambitious. The BLUE Map Scenario of the IEA Energy Technology Perspectives 2010, and the 450 Scenario of the IEA World Energy Outlook 2010, aim to illustrate the deep changes in the energy sector that would lead to emission paths broadly compatible with limiting global warming to 2°C. Solar energy, i.e., solar photovoltaics, concentrating solar power and solar heating, are the energy technologies exhibiting the fastest growth in these scenarios.

In conclusion, in the next half century, the photovoltaics is very likely to become an important source of the electricity in the world. Nations that encourage solar will be leaders in this shining new technology, leading the way to a cleaner, more equitable twenty-first century, while those that ignore solar technology revolution will be left behind in the green, economic energy revolution.

**About the Author:** Aafia Sarosh is a Certified Trainer from the Renewables Academy (RENAC) AG of Germany and is currently serving as a Renewable Energy Consultant at Women in Renewable Energy (WIRE) Pakistan. A Renewable Energy Graduate from The University of Hull, United Kingdom, Ms. Sarosh has extensive experience in energy sector having served in British Standard Organisation (BSI), United Kingdom, and Business Quality Certification (BQC), Greece. Her areas of interest include Renewable Energy, Sustainable Development Goals (SDGs), Climate Change, Energy Policy and Environment. **Email:** [aafia381@gmail.com](mailto:aafia381@gmail.com).



## DEVELOPMENT AND S&T NEWS FROM MEMBER STATES AND BEYOND

### Germany and USA to launch mRNA Vaccine Plants in Africa

COVID-19 Pandemic management has been especially trying for the developing world. According to the World Health Organization (WHO), around 17% of the world's population lives in Africa and the continent does not have the desirable level of access to COVID-19 vaccine. From 50 countries, only 15 have reasonable access to it and only 10% of the continent's population is vaccinated as yet. To meet the needs of African health system, German company BioNTech has joined hands with the Rwandan government and Institut Pasteur de Dakar of Senegal for the manufacturing of first mRNA vaccine plant in Africa in mid-2022 (Reuters, 26th October 2021).

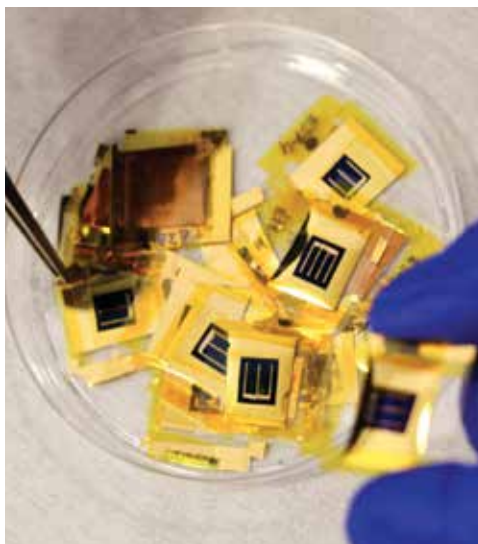
Similarly, Moderna plans to invest up to \$500 million to establish a vaccine manufacturing factory in Africa that could produce up to 500 million doses of mRNA vaccines each year. Of late, World Health Organization (WHO) has been urging advanced countries to setup COVID-19 vaccine plants in the ignored African continent.

These manufacturing units of vaccines will help reduce healthcare inequalities brought by coronavirus pandemic and ameliorate continent's health-related issues (Forbes, 8th October 2021).

### Silicon Solar Cell Developed by Turkey

Two Turkish scientists have developed a solar cell using local resources that has the potential to contribute to the country's space programme (Daily Sabah, 8th October 2021). These silicon-based cells are cheaper than gallium arsenide and can be used to power satellites, aviation and military vehicles.

These cells were developed by Prof.

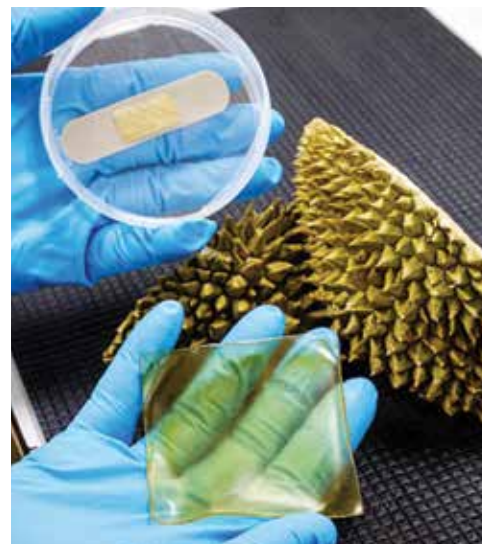


Ugur Serincan and Associate Professor Mustafa Kulakci from the Eskisehir Technical University of Turkey whose study was financially backed by the Scientific and Technological Research Council of Turkey (TUBITAK). Both researchers also received prize in an international invention fair held in Istanbul.

Prof. Kulakci views that solar cell production has reduced substrate cost as the Earth has limited gallium resources. These resources are to be shared between multiple sectors, from photovoltaic to optoelectronics and telecommunications, which drives up the prices. Hence, silicon solar can help solve this issue.

### Antibacterial Bandage from Food Waste

Fruit husks are generally discarded and are a major factor contributing to environmental waste. To help mitigate the related environmental toll, scientists from the Nanyang Technological University (NTU) of Singapore have developed antibacterial bandages from food wastage (Reuters, 20th September 2021). Scientists extracted cellulose powder from the sliced and freeze-



dried fruits husks and then mixed it with glycerol. This mixture was then cut into bandage strips once it became soft hydrogel. Prof. William Chen, Director of the Food Science and Technology programme at NTU, said, "Singapore consumes about 12 million durians in the year, so besides the flesh, we can't do much about the husk and the seeds and this causes environmental pollution".

Not only the production of these antimicrobial bandages economical, they can also help keep wound moist and cooler to speed-up the healing.

### SpaceX to Launch Türksat 6A Satellite of Turkey

US based SpaceX is to launch Türksat 6A, Turkey's first domestically produced communication satellite, in 2023. The production, integration and test stages are being completed in the Space Systems Assembly, Integration and Test (AIT) Center, Ankara. Having found most suitable after due analysis, SpaceX's Falcon 9 rocket will be used to launch Türksat 6A.

Turkey is one of the 10 countries that can produce its own communication

satellite. Before that, the Türksat 5A satellite was also launched by SpaceX in January 2021, which secures the rights for Turkey for coming 30 years (Daily Sabah, 18th September 2021).

## Jordan Joins Efforts to Curb Infectious Diseases in Migratory Birds

Jordan has joined hands with an international network, The Avian Zoonotic Disease Network (AZDN), in a bid to control the spread of diseases among migratory birds. AZDN aims to identify dangerous infectious diseases and pathogens of pandemic potential, such as Avian Influenza. The Network will be proactive in developing on-the-ground strategies and bio-surveillance techniques. This includes investigating the prevalence of pathogens in migratory birds, examining host and environmental determinants of infections, and implementing protocols across Jordan, Georgia, Ukraine, and the United States. With this multilateral effort, Jordan will be able to utilize sequencing technologies and bioinformatics to better understand the ecology of evolving diseases (The Jordan times, 26th September 2021).

## Ghanaian Innovative Handwashing Facilities helps Public Fight COVID-19

Since the outbreak of COVID-19 has necessitated and popularized hand washing globally, communities in developed and developing countries alike have devised ways to ease the widespread and frequent handwashing. In this regard, Ghanaian engineers have helped create innovative ways keeping in view national needs.

Yaw Adusi-Poku, a Ghanaian engineer, transformed a mobile handwashing facility to become 'no contact' that



helps curb the spread of infection. The innovation is also equipped to withstand power outages.

In another innovation that has its origins in 2015 time of Ebola outbreak, Emmanuel Buaben, a young Ghanaian inventor, utilizes a simple solution using plastic oil containers. This simple machine involves a tap-fitted small water tank, soap and sanitizer and a bucket. This later became 'Adam Smart' with a slight mechanical intervention that helped people use it with foot. The facility costs only a total of only 300 Ghana cedis (50 U.S. dollars).

Innovations are also being developed to make it more convenient for the disabled to wash hands in public places. One such attempt is a specially-designed handwashing facility with a lower height and customized handles operable by elbows. (Xinhua, 18th October 2021)

## Gambia's Ambitious Projects

The Gambia's main sources of energy are firewood, electricity, petroleum imports, and Liquefied Petroleum Gas (LPG). The country also has several projects that use RETs.

The Gambia is rapidly gaining ground to help diversify its energy mix by adding new sources of renewable energy. The country is the first in the world to run around 1,100 rural schools and health centers on solar technology. There are many renewable energy bilateral initiatives in the country, as well as those being funded by multilateral institutions, such as the European Investment Bank (EIB). One of the projects, Renewable Energy Potentials in The Gambia (REPGam), funded by the German Federal Ministry of Education and Research (BMBF), launched in September 6, 2021.

According to Dr. Yusupha Touray (Deputy Permanent Secretary of Ministry of Higher Education), REPGam project would facilitate timely availability of clean and affordable electricity in 23 different communities in The Gambia. In 2019, an initiative worth €142 million was taken to promote renewable energy sector backed by the European Investment Bank, the World Bank, and the European Union. In 2019, The Gambia also rectified African Continental Free Trade Agreement (AFCTFTA) (Africa News, 16th September 2021).

## Turkey and Nigeria Cooperation

Turkey's Energy and Natural Resources Minister, Fatih Dönmez, has informed that Turkey is planning to sign three agreements in mining & energy sector and hydrocarbons with Nigeria. Nigeria being the largest African oil producer and trading partner of Turkey in sub-Saharan Africa and Turkey being oil and gas supplier, both countries want to continue mutually beneficial investments and cooperation (Daily Sabah, 8th October 2021).

Both countries have reviewed their existing bilateral relations and identified the key areas for investment & cooperation and discussed collaboration opportunities in the fields of energy and mining as well as industry, technology, agriculture, transportation, health, education, culture, tourism and sports. The existing volume of trade between Turkey and Nigeria stands at US\$ 2 billion at the end of 2020.

## Solar-powered Irrigation Solutions Being Scaled-up in Senegal

Senegal is working to scale-up its

solar-powered irrigation. A working arrangement in this direction is coming about through an agreement between InfraCo Africa and Bonergie Irrigations Senegal. This partnership intends to ease the effect of climate change on farmers (Power Engineering International, 29th September 2021).

In new agreements, InfraCo has agreed to provide an additional US\$ 2.4 million to increase farmer's access to solar-powered irrigation solutions in Senegal. The cooperation also entails installation of at least 2,000 pumps in next three years. It is projected that the phase II of the Bonergie project will end in 2023 and, being a shareholder, InfraCo Africa will continue its support.

In earlier agreements signed in 2019, between InfraCo Africa, and Bonergie Senegal, hundred solar-powered irrigation systems were set up.

## China to Launch First Big Data Research Centre for SDGs

China is going to launch first International Big Data Research Center for Sustainable Development Goals (SDGs) to enable the implementation of the UN 2030 Agenda. A global

monitoring and evaluation system will be established for data sharing, technological and decision making support for member states and relevant UN agencies (CGTN, 6th September 2021).

The coverage of monitoring indicators can also be improved by producing new datasets by using Big Earth data. BE data broadly used in SDGs research, mostly comprises of satellite remote sensing data, sensor network data, trajectory data, social and economic statistics data, opinion and behavior data, transaction data and survey data.

## UN to Inaugurate Industrial Compact Center in Abuja

The United Nations is planning to establish a global compact hub for businesses in Nigeria to help the country achieve industrialization through SDGs.

Ms. Amina Mohammed (United Nations Deputy Secretary General for Sustainable Development Goals) made an announcement in this regard during an event organized by Manufacturers Association of Nigeria (MAN) on its 50th anniversary on "Industrialization and Sustainable Development Goals".

COVID-19 has adversely affected efforts towards almost all 17 of the SDGs. During 2020 alone, 124 million went back to poverty and 255 million jobs were lost worldwide.

This hub for business initiative is expected to create a huge job market and bring industrial boost in Nigeria which was pushed back due to the Pandemic. Through MAN's support, Nigeria is set to benefit from the 4th industrial revolution by increasing digital expansion and promoting climate friendly industries (United Nations, 7th October 2021).



## 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) post-graduate scholarships, for Masters of Science in Mathematics at Lahore Campus of COMSATS University Islamabad (CUI), in collaboration with the International Centre for Theoretical Physics (ICTP), Italy.
- Five (05) post-doctoral fellowships at the International Center for Chemical and Biological Science (ICCBS), Pakistan.
- Five (05) post-doctoral fellowships at the National Research Centre (NRC), Egypt.
- Two (02) PhD scholarships at the Al-Farabi Kazakh National University (KazNU), Kazakhstan.
- 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](http://www.comsats.org) or write to [farhan@comsats.org](mailto:farhan@comsats.org).

## 3rd International Symposium on Climate Change & Water 2022

Being organized under the theme "Extreme Drought", the Symposium aims to highlight latest developments in research on extreme events; evolution and acceleration of the effects of climate change on water cycle; understanding extreme weather events and forecasting; adaptation to climate change; and related management, governance, strategy, among others. Organized by MiDi (Environments & Diversity), ECRA in collaboration with other partners, the event invites scientists, academicians, researchers and other stakeholders working in areas relevant to water cycle and adaptation to extreme events.

**Deadline:** December 05, 2021

**Conference dates:** May 31-June 2, 2022

**For details and application, visit:**  
<https://ccw2022.sciencesconf.org>

### Call for Applications

**Training Course on Industrial Synthetic Biotechnology:** COMSATS Joint Center for Industrial Biotechnology (CCIB) and Tianjin Institute of Industrial Biotechnology (TIB) of Chinese Academy of Sciences (CAS), are inviting applications for the second International Training Course on Industrial Synthetic Biotechnology. Scientists from the Belt and Road countries, especially those from the Alliance of International Science Organizations (ANSO) members and COMSATS Centres of Excellence are encouraged to apply.

**For further details and application process, visit:** [http://english.tib.cas.cn/ns/ue/202110/t20211029\\_289677.html](http://english.tib.cas.cn/ns/ue/202110/t20211029_289677.html)

## COMSATS Network of Centres of Excellence



BCSIR-Bangladesh  
[www.bcsir.gov.bd](http://www.bcsir.gov.bd)



Embrapa Agrobiologia-Brazil  
[embrapa.br/agrobiologia](http://embrapa.br/agrobiologia)



ICCES-China  
[english.icces.ac.cn](http://english.icces.ac.cn)



TIB-China  
[english.tib.cas.cn](http://english.tib.cas.cn)



CIF-Colombia  
[www.cif.org.co](http://www.cif.org.co)



NRC-Egypt  
[www.nrc.sci.eg](http://www.nrc.sci.eg)



UTG-The Gambia  
[www.utg.edu.gm](http://www.utg.edu.gm)



CSIR-Ghana  
[www.csir.org.gh](http://www.csir.org.gh)



ITS-Indonesia  
[www.its.ac.id](http://www.its.ac.id)



IROST-Iran  
[www.irost.org](http://www.irost.org)



ICENS-Jamaica  
[www.icens.org](http://www.icens.org)



KazNU-Kazakhstan  
[www.kaznu.kz/en/](http://www.kaznu.kz/en/)



RSS-Jordan  
[www.rss.jo](http://www.rss.jo)



ICCBS-Pakistan  
[www.iccs.edu](http://www.iccs.edu)



NMC-Nigeria  
[www.nmc.edu.org](http://www.nmc.edu.org)



CUI-Pakistan  
[www.comsats.edu.pk](http://www.comsats.edu.pk)



AQU-Palestine  
[www.alquds.edu/en](http://www.alquds.edu/en)



UCAD-Senegal  
[www.ucad.sn](http://www.ucad.sn)



ITI-Sri Lanka  
[www.iti.lk/en](http://www.iti.lk/en)



IRCC-Sudan  
[www.ircc.gov.sd](http://www.ircc.gov.sd)



HIAST-Syria  
[www.hiast.edu.sy](http://www.hiast.edu.sy)



TIRDO-Tanzania  
[www.tirdo.or.tz](http://www.tirdo.or.tz)



CERTe-Tunisia  
[www.certe.rnr.tn](http://www.certe.rnr.tn)



TÜBİTAK-Turkey  
[www.tubitak.gov.tr/en](http://www.tubitak.gov.tr/en)



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.