FORUM FOR INDIAN SCIENCE DIPLOMACY

SCIENCE DIPLOMACY NEWS ALERTS | 16-31 AUGUST 2020 | ISSUE 44 www.fisd.in

NEWS ALERT

Forum for Indian Science Diplomacy

RIS Science Diplomacy News Alert is your fortnightly update on Indian and global developments in science research, technological advancements, science diplomacy, policy and governance. The archives of this news alert are available at http://fisd.in. Please email your valuable feedback and comments to science.diplomacy@ris.org.in

CONTENTS

COVID-19 pooling test method identifies asymptomatic carriers

DNA nano-switches rapidly detect Sars-Cov-2 and other emerging viruses

Researchers unravel two mysteries of COVID-19

COVID-19 (INDIA)

Awards announced for Indo-U.S. Virtual Networks for COVID-19

An Indian start-up sets up portable hospital infrastructure for COVID -19

INDIA – SCIENCE & TECHNOLOGY

UK launches £3 million innovation challenge fund in India

Indigenous air unique-quality monitoring (AUM) photonic system developed

Invisible shield for electromagnetic interference developed

Nigeria signs MoU with India on cooperation in outer space

DST grants Rs. 1.70 billion to IIT Delhi to set up Technology Innovation Hub

ARCI scientists convert tamarind waste & cotton waste to supercapacitor electrodes

INST scientists develop new nano-particle-based treatment for kala azar

DST encourages translational research on Carbon Capture, Utilisation & Storage

NRDC and NAL to incubate aerospace engineering start-ups

IIT Kharagpur develops micro-needle, to deliver drug painlessly

IN BRIEF

Light-responsive top layer of plastic film induces movement

'Selfies' could be used to detect heart disease

A new iron based superelastic alloy capable of withstanding extreme temperatures

RESOURCES AND EVENTS

DST launches "In Conversation with" Series with thought leaders from STI ecosystem

China boosts R&D spending in 2019 by more than 10%

Rio Conventions Shift All physical meetings to 2021

GLOBAL

Enzyme cocktail developed powers production of ethanol

Researchers at the Brazilian Center for Research in Energy and Materials (CNPEM) have genetically engineered a fungus to produce a cocktail of enzymes that break down the carbohydrates in biomass, such as sugarcane trash and bagasse, into fermentable sugar for industrially efficient conversion into biofuel. The fungus Trichoderma reesei is one of the most prolific producers of plant cell wall-degrading enzymes and is widely used in the biotechnology industry. The researchers introduced six genetic modifications into RUT-C30, a publicly available strain of the fungus, using the CRISPR/Cas9 gene-editing technique, enabling the fungus to produce a large number of enzymes from agro-industrial waste, a cheap and abundant feedstock in Brazil. The bioprocess produced 80 grams of enzymes per liter, the highest experimentally supported liter so far reported for T. reesei from a low-cost sugar-based feedstock. The technology can be used to break down other kinds of biomass, and advanced sugars to produce other biorenewables such as plastics and intermediate chemicals.

'Cyborg' technology could enable new diagnostics, merger of humans and AI

Although true "cyborgs" -- part human, part robotic beings -- are science fiction, researchers are taking steps toward integrating electronics with the body. Such devices could monitor for tumour development or stand in for damaged tissues. But connecting electronics directly to human tissues in the body is a huge challenge. Researchers have reported new coatings for components that could help them more easily fit into this environment. Traditional microelectronic materials, such as silicon, gold, stainless steel and iridium, cause scarring when implanted. For applications in muscle or brain tissue, electrical signals need to flow for them to operate properly, but scars interrupt this activity. After testing, the researchers found that the polymer, known as poly (3,4-ethylenedioxythiophene) or PEDOT, had the properties necessary for interfacing hardware and human tissue and dramatically improved the performance of medical implants by lowering their impedance two to three orders of magnitude, thus increasing signal quality and battery lifetime in patients.

New superlattice material for future energy efficient devices

An international team of physicists at Stony Brook University, has created a new material layered by two structures, forming a superlattice, that at a high temperature is a super-efficient insulator conducting current without dissipation and lost energy. The finding could be the basis of research leading to new, better energy efficient electrical conductors. The material is created and developed in a laboratory chamber. Over time atoms attach to it and the material appears to grow similar to the way rock candy is formed. Surprisingly, it forms a novel ordered superlattice, which the researchers test for quantized electrical transport. The research centers around the Quantum Anomalous Hall Effect (QAHE), which describes an insulator that conducts dissipation less current in discrete channels on its surfaces. Because

Versatile new material family could have many applications

Researchers at Texas A&M University and the U.S. Army Combat Capabilities Development Command Army Research Laboratory have created a whole family of synthetic materials that range in texture from ultra-soft to extremely rigid. The materials are 3D printable, rapid self-healing, recyclable and they naturally adhere to each other in air or underwater. Their characteristics make them suited for prosthetics and soft robotics, and also ideal for broad military applications such as agile platforms for air vehicles and futuristic self-healing aircraft wings. The materials are based on elastomeric polymers, or elastomers, by making the crosslinks dynamic and reversible so that materials are recyclable. They used a parent polymer, called prepolymer, and then chemically studded these prepolymer chains with two types of small cross-linking molecules -- furan and maleimide.

Biomorphic batteries could provide 72 times more energy for robots

Like biological fat reserves store energy in animals, a new rechargeable zinc battery integrates into the structure of a robot to provide much more energy, a team led by the University of Michigan has shown. The study estimated that robots could have 72 times more power capacity if their exteriors were replaced with zinc batteries, compared to having a single lithium ion battery. The new battery works by passing hydroxide ions between a zinc electrode and the air side through an electrolyte membrane. That membrane is partly a network of aramid nanofibers- the carbon-based fibers found in Kevlar vests -- and a new water-based polymer gel. The gel helps shuttle the hydroxide ions between the electrodes. Made with cheap, abundant and largely nontoxic materials, the battery is more environmentally friendly than those currently in use.

New device can measure toxic lead within minutes

Rutgers researchers have created a miniature device for measuring trace levels of toxic lead in sediments at the bottom of harbours, rivers and other waterways within minutes -- far faster than currently available laboratory-based tests, which take days. The affordable lab-on-a-chip device could also allow municipalities, water companies, universities, K-12 schools, daycares and homeowners to easily and swiftly test their water supplies. Apart from detecting lead contamination in environmental samples or water in pipes, in future, it would be possible to check whether the fish has led or mercury in it. Detecting toxic metals like lead, mercury and copper normally requires collecting samples and sending them to a lab for costly analysis, with results returned in days. The new device extracts lead from a sediment sample and purifies it, with a thin film of graphene oxide as a lead detector. More research is needed to further validate the device's performance.

Novel 3D-printed device demonstrates enhanced capture of carbon dioxide emissions

The Department of Energy's Oak Ridge National Laboratory researchers have designed and additively manufactured a first-of-its-kind aluminum device that enhances the capture of carbon dioxide emitted from fossil fuel plants and other industrial processes. Solutions for reducing global emissions of heat-trapping greenhouse gases such as CO2 address the continued use of low-cost, domestic fossil fuel resources while mitigating potential climate impacts. ORNL's device focuses on a key challenge in conventional absorption of carbon using solvents. By using additive manufacturing, researchers were able to custom design a multifunctional device that greatly improves the process efficiency by removing excess heat while keeping costs low. According to researchers, the success of this 3D printed intensified

optimizing operating conditions and device geometry to produce additional improvements in the carbon capture absorption process.

New groundwater drinking water sources in Bangladesh through nuclear technology
An IAEA-supported study conducted by the Bangladesh Atomic Energy Commission using isotopic techniques has found that deeper groundwaters in the Barguna and Patuakhali districts in south-western Bangladesh are free of arsenic and sea water intrusion, meaning they are a viable additional source of drinking water for a region made up of over two million people. Isotopes are the most direct and powerful tools available to estimate the age, vulnerability and sustainability of water resources. The isotope data from the study revealed the existence of long-term high-quality drinking water in the deeper 300-meter aquifers in the Barguna and Patuakhali districts. In hydrology, some naturally occurring radioactive isotopes present in water, such as tritium (3H), carbon-14 (14C) and noble gas radioisotopes, provide clues about the origin and history of water samples.

Breakthrough in artificial photosynthesis for fuel production
UK researchers have developed a new device which takes CO2, water, and sunlight as its ingredients, and then produces oxygen and formic acid that can be stored as fuel. The acid can either be used directly or converted into hydrogen – another potentially clean energy fuel. Key to the innovation is the photosheet - or photocatalyst sheet - which uses special semiconductor powders that enable electron interactions and oxidation to occur when sunlight hits the sheet in water, with the help of a cobalt-based catalyst. No additional components are required for the reaction to occur, and it's fully self-powered. While the prototype photosheet can be relatively easy to scale up without incurring huge costs. Ultimately, these sheets could be produced in large arrays, similar to those on solar farms. The researchers need to make the process a lot more efficient first; and are also experimenting with different catalysts that may be able to produce different solar fuels

COVID-19

COVID-19 (WORLD)

Inconsistencies in data presentation could harm efforts against COVID-19
Since COVID-19 emerged late last year, there's been an enormous amount of research produced on this novel coronavirus disease. According to Children's National Hospital scientists' new study, however, the content publicly available for this data and the format in which it's presented lack consistency across different countries' national public health institutes, greatly limiting its usefulness. The information available about different countries showed a startling lack of consistency, not only for sex-disaggregated data, but also for any type of clinical or demographic information. The study recommends that COVID-19 data should be shared among countries using a standardized format and standardized content, informed by the success of GISAID and under the backing of the WHO. It will enable countries to not only emerge from COVID-19 but also help prepare for the next pandemic.

Low-cost, accurate COVID-19 antibody detection platform
A robust, low-cost imaging platform utilizing lab-on-a-chip technology created by University of California, Irvine scientists may be available for rapid coronavirus diagnostic and antibody testing throughout the nation by the end of the year. So far, antibody testing in the U.S. has been too inaccurate or expensive to reach the necessary numbers. But UCI investigators believe that the new technology can help accelerate the testing process quickly and affordably. Using blood from a finger prick, the UCI test probes hundreds of antibody

keep hospitals clear of patients with standard colds and flus. The researchers are partnering with UCI start-ups Velox Biosystems Inc. and Nanommune Inc. to scale up production. The Tiny-Array imager will be ready to deploy across the U.S. by the end of 2020 and are working with scientists in Uruguay, Russia and Thailand to develop similar systems for their nations.

COVID-19 pooling test method identifies asymptomatic carriers

P-BEST, an algorithmic method for pooling-based efficient SARS-CoV-2 testing, has been developed by a group of Israeli researchers In the current study, 384 samples were divided into only 48 pools providing an eightfold increase in testing efficiency and similar reduction in testing costs for reagents. These 48 pools were then tested using a COVID-19 PCR-based diagnostic protocol that included an RNA extraction stage. After testing each of the 48 pools individually, the researchers successfully identified up to five positive carriers within the 384 samples, without having to test the subjects in that pool. P-BEST can be configured on the basis of the carrier rate, and the lower the carrier rate, the higher efficiency. P-BEST is ideal for conducting carrier screening when infection rates are very low, less than one percent and will provide significant savings in reagents and other diagnostic testing resources while significantly increasing testing capacity. A company Poold Diagnostics has been set up to scale up this technology which has been approved by the Israeli authorities.

DNA nanoswitches rapidly detect Sars-Cov-2 and other emerging viruses

Chinese researchers have developed DNA nano-switches that bind to both ends of target viral RNAs, forming loop-shaped compounds. These negatively-charged, RNA-containing nano-switch loops are then placed in a gel and stimulated with an electrical current, pulling them towards a positive electrode on the other end of the gel. Since the nano-switches move more slowly when they are bound to viral RNA, this gel electrophoresis technique reveals the virus' presence. The researchers first tested this approach with the Zika virus genome and demonstrated its ability to detect clinically-relevant levels of Zika RNA in human urine. They also developed nano-switches to target SARS-CoV-2 RNA in human saliva, finding that they could successfully detect the virus' presence within about 2 hours. The nano-switches also successfully differentiated between Zika virus and Dengue virus, which occur in overlapping geographical regions and cause similar symptoms, demonstrating the nano-switches' potential to avoid misdiagnoses.

Researchers unravel two mysteries of COVID-19

A team from Lawson Health Research Institute and Western University has made significant steps forward in understanding COVID-19 through two back-to-back studies. In one study, the team has identified six molecules that can be used as biomarkers to predict how severely ill a patient will become. In the other study, they are the first to reveal a new mechanism causing blood clots in COVID-19 patients and potential ways to treat them. The researchers identified six molecules of importance (CLM-1, IL12RB1, CD83, FAM3B, IGFR1R and OPTC). They found that these molecules were elevated in COVID-19 patients who would become even more severely ill. These findings could be incredibly important in determining how severely ill a patient will become. The team notes that predicting a patient's disease severity could allow for medical teams to have important conversations with family members, setting goals of care based on the patient's health and personal wishes.

COVID-19 (INDIA)

Eight binational teams consisting of researchers from India and the US have received awards to pursue cutting-edge research in pathogenesis and disease management of COVID-19 through Indo-US virtual networks. The areas of research they will pursue include antiviral coatings, immune modulation, tracking SARS CoV-2 in wastewater, disease detection mechanisms, reverse genetics strategies, and drug repurposing. The Indo-US Science and Technology Forum (IUSSTF) announced the awards to eight binational teams which would harness the combined expertise of the Indian and U.S. Science & Technology communities in COVID-related research, and leverage existing infrastructure from both countries to further advance the research and accelerate progress. These eight teams will be pursuing cutting-edge research in areas that include studies on pathogenesis and disease management in COVID-19, antiviral coatings, immune modulation, tracking SARS CoV-2 in wastewater, disease detection mechanisms, reverse genetics strategies, and drug repurposing.

An Indian start-up sets up portable hospital infrastructure for COVID -19

The COVID 19 pandemic has highlighted the need to set up systems to improve health infrastructure, particularly in rural areas. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) in collaboration with 'Modulus Housing' a start-up incubated by IIT Madras has come up with a solution using decentralised approach to detect, manage and treat COVID-19 patients in local communities through portable microstructures. Scientists from SCTIMST have developed the portable microstructure named as "MediCAB", which is modular, portable, durable, easy to set up and can be customised as per the requirements of the customer. It is foldable and is composed of four zones – a doctor's room, an isolation room, a medical room/ward, and a twin-bed ICU, maintained at negative pressure. It can be easily transported and installed anywhere in just two hours. It has in-built electricals, which are just plug-n-play. MediCAB can withstand harsh weather and heavy rains as well.

INDIA – SCIENCE & TECHNOLOGY

UK launches £3 million innovation challenge fund in India

The UK government has launched a £3 million innovation challenge fund in India to support scientists in academia and industry to tackle the COVID-19 pandemic and climate change. The fund invites tech innovators with connections to the AI-Data cluster in Karnataka and the future mobility cluster in Maharashtra to submit research and development proposals for tackling COVID-19 or which promote a greener planet. At least 12 grants up to £250,000 are expected to be awarded. Applicants are required to submit bids as an academia-industry consortium, ideally with an international member. The deadline for submitting two-page concept notes is August 31. These grants will support the development of Indian tech clusters by breaking down barriers to growth, including building international links. The initiative is part of the UK-India Tech Partnership, which aims to bring together the best minds working in tech to unlock its future potential and deliver high-skilled jobs and economic growth in both countries.

Indigenous air unique-quality monitoring (AUM) photonic system developed

Researchers from Indian state of Kerala developed an indigenous photonic system for real-time remote monitoring of air quality parameters. During the tests, the system was found to be highly sensitive and accurate and capable of simultaneous detection and quantification of all air quality parameters. It is portable, compact, low powered and economical, works on plug and play systems, requires no setting up time, and no additional civil infrastructure for

quantify various pollutants simultaneously (of orders of less than one part per billion) and meteorological parameters, with very high precision, sensitivity and accuracy.

Invisible shield for electromagnetic interference developed

Scientists from Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru have have designed a transparent shield for electromagnetic interference (EMI). The invisible shield can be used in various military stealth applications and can cover electromagnetic wave emitter or absorber devices without compromising their aesthetics. The CeNS team has developed a copper metal mesh on polyethylene terephthalate (PET) sheet as its substrate, which exhibits a visible transmittance (T), a parameter of visible transparency of about 85 percent and sheet resistance (Rs) ~ 0.83 ohm per square cm. The invention has the potential to satisfy the huge demand for highly effective transparent and flexible EMI shields, which can cover electromagnetic wave emitter/absorber devices without compromising their aesthetics.

Nigeria signs MoU with India on cooperation in outer space

Nigeria has signed a Memorandum of Understanding (MoU) with India on "Cooperation in the exploration and use of outer space for peaceful purposes", covering space science, planetary exploration, ground stations, development of micro and mini satellites and joint Space R&D. It provides for capacity building assistance by ISRO, exchange of scientific know-how, exchanges between academic institutes and joint symposiums/conferences. The recent MoU will further enhance India's capacity-building assistance to Nigeria. On the occasion, both sides also agreed to sign a subsidiary MoU between New Space India Limited (NSIL), under ISRO, and Nigeria Erosion and Watershed Management Project (NEWMAP), under the Federal Ministry of Environment of Nigeria, on cooperation in the use of Geospatial Technologies.

DST grants Rs. 1.70 billion to IIT Delhi to set up Technology Innovation Hub

The Department of Science and Technology (DST), Government of India, has granted Rs. 1.70 billion to IIT Delhi under the National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) to set up a Technology Innovation Hub on Cobotics, known as I-Hub Foundation for Cobotics (IHFC). IHFC will not only perform research in the area of Collaborative Robotics i.e. Cobotics, but also proactively translate the outcomes into products for the benefit of humanity. The four verticals that will be covered under the IHFC are medical robotics, agriculture and disaster management, defense, and smart manufacturing (Industry 4.0). The focus will be the technologies where robots should be able to work together with humans for maximising the benefit of human intelligence with robots' precision and ability to work tirelessly in an environment where the humans cannot work.

ARCI scientists convert tamarind waste & cotton waste to supercapacitor electrodes

Scientists at the International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), have developed a couple of cost-effective electrode material for making affordable supercapacitor devices, from waste biomass like tamarind seeds and industrial cotton waste. They have converted the waste materials into highly porous carbon fibres by activation process and then utilised the porous carbon fibres to make high-performance supercapacitor electrodes. The electrode materials made from the biomass waste has been tested for pore characteristics and stability. The material exhibited a superior double layer capacitance value at all the applied potentials, with high surface area (2645 m2 g-1) within 1 hour of the experiment, showing that the material could be used for supercapacitor

INST scientists develop new nano-particle-based treatment for kala azar

Scientists from the Institute of Nano Science and Technology (INST), Mohali, have developed an oral nano-medicine by combining different compounds for combating kala azar, called Visceral Leishmaniasis (VL) a disease in which a parasite migrates to the internal organs such as the liver, spleen or bone marrow and, if left untreated, will almost always result in the death of the host. An estimated 150,000 new cases per year occur in India and also in many other developing countries such as Bangladesh, Brazil, China, Ethiopia, India, Kenya, Nepal, Somalia, South Sudan, and Sudan. The technology involves using Anti-leishmanial drugs Amphotericin-B and Paromomycin encapsulated in solid lipid nano-particles and further modified with a Hydroxypropyl-Cyclodextrin compound. The nano-particle combinatorial drug delivery system developed by them enhanced the efficacy of the formulation without causing any significant toxic side-effects.

DST encourages translational research on Carbon Capture, Utilisation & Storage

Researchers interested in translational research on Carbon Capture, Utilisation, and Storage (CCUS) now have a major opportunity to accelerate and mature their technology and research activities under the Mission Innovation (MI) Programme, a global initiative of 24 countries and the European Union to accelerate the global clean energy innovation in which the Department of Science & Technology (DST) is an active partner. The DST has already funded 19 R&D projects in the area of CCUS under the MI umbrella, partnering with 13 MI countries. Currently, the DST has invited proposals from Indian researchers in the area of CCUS under Accelerating CCUS Technologies (ACT) in collaboration with other ACT member countries. ACT is seeking innovative projects that range from smaller research projects to new or already existing pilot and demonstration facility sites.

NRDC and NAL to incubate aerospace engineering start-ups

National Research Development Corporation (NRDC) and Council of Scientific and Industrial Research-National Aerospace Laboratories (CSIR-NAL) have joined hands to establish an Innovation cum Incubation Centre with external private funding to promote start-ups in the emerging area of Aerospace technologies. Under this program start-ups in the area of Aerospace engineering would be incubated, mentored and supported for product and prototype development and their validation. The NRDC and CSIR-NAL's innovative partnership will promote start-ups in the niche high tech area of Aerospace engineering and this partnership may pave a way for establishing Innovation cum Incubation Centres in other CSIR laboratories which are working in different thematic areas and help to create employment opportunities.

IIT Kharagpur develops micro-needle, to deliver drug painlessly

Researchers from the Indian Institute of Technology at Kharagpur have developed a micro-needle, which is thinner than a human hair, and a micro-pump for injecting drugs to patients in a painless way. They have developed the micro-pump and the micro-needle to feed into the transdermal drug delivery systems designed to deliver biologically active agents through the skin, principally by diffusion in a painless process. The micro-needles operate by means of a pressurized and controlled micro-pump delivering the drug through the skin. The micro-needles are painless as they are too small to touch the nerves in the skin and induce painful reactions. The researchers have also filed for a patent in India.

IN BRIEF

Light-responsive top layer of plastic film induces movement

cells. Scientists from Nagoya University, Japan have now found that only a thin, topmost layer of the light-dependent azobenzene-containing plastic film needs to be light-sensitive, rather than the entire film. These newly discovered properties have vast implications, from improving the economics of production and lowering material prices, to advancing the field of nanotechnology itself.

'Selfies' could be used to detect heart disease

Sending a "selfie" to the doctor could be a cheap and simple way of detecting heart disease, according to a new study published in the European Heart Journal by a Chinese team. The study shows that it's possible to use a deep learning computer algorithm to detect coronary artery disease (CAD) by analysing four photographs of a person's face. Although the algorithm has the potential to be used as a screening tool that could identify possible heart disease in people. Certain facial features are associated with an increased risk of heart disease. The study highlights a new potential for AI tools in medical diagnostics.

A new iron based superelastic alloy capable of withstanding extreme temperatures

Researchers from Tohoku University have discovered a novel iron-based super-elastic alloy (SEA) capable of withstanding extreme temperatures -both high and low. They developed an iron-based SEA system, known as Fe-Mn-Al-Cr-Ni. This cost-effective SEA can also operate at a much wider temperature range and controllable temperature dependence. Increasing the amount of Chromium changes the temperature dependence from a positive to a negative including zero temperature dependence with the critical stress remaining almost constant at various temperatures. The discovery has potential wide-spread application for outer-space exploration and in buildings or column elements in bridges.

RESOURCES AND EVENTS

DST launches "In Conversation with" Series with thought leaders from STI ecosystem

In the context of India's 5th national Science, Technology, and Innovation policy, STIP 2020, the Office of the Principal Scientific Adviser to the Government of India (Office of the PSA) and the Department of Science and Technology (DST) has initiated a decentralized, bottom-up, and inclusive process for the formulation of a new STIP 2020. To make the policy true to its essence, DST is initiating "In Conversation with" - a series of exclusive interactions with thought leaders from across the country to share their ideas and vision for the policy and the nation's Science, Technology and Innovation ecosystem. Dr Harsh Vardhan, Minister of Science and Technology inaugurated the series on 28 August 2020; he was in conversation with Prof. Ashutosh Sharma, Secretary, DST. The new policy is expected to be released later this year, replacing the existing policy, which was formulated in 2013.

China boosts R&D spending in 2019 by more than 10%

China's total public and private science and technology expenditures in 2019 rose 12.5% over the previous year to $322 billion, with basic research accounted for 6% of the total; applied research, 11.3%; and development, 82.7%. The spending amounted to 2.23% of GDP, an increase of 0.09 percentage points from the previous year. A target of 2.5% of GDP by 2020 goal was set in China's most recent Five Year Plan and in a 15-year Medium- and Long-Term Program for Science and Technology Development. In comparison, the United States spent 2.83% of GDP on R&D in 2018, while Israel and South Korea spent 4.9% and 4.5% of GDP, respectively, in 2018. China is the world's second biggest spender on R&D in absolute terms, after the United States.

Rio Conventions Shift All physical meetings to 2021

All three Rio Conventions have announced that subsidiary body physical meetings previously scheduled to take place in 2020 will now take place in 2021. The Secretariats of the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the UN Convention to Combat Desertification (UNCCD) made these changes due to the COVID-19 pandemic and to ensure the completion of work leading to each milestone event. The CBD Secretariat will convene virtual sessions in September 2020. The launch of the 5th Global Biodiversity Outlook report (GBO-5) will also take place in September. CBD COP 15 is now expected to take place from 17-30 May 2021, in Kunming, China. The UNFCCC COP Bureau decided that the 26th session of the Conference of the Parties (COP 26), which was originally scheduled to take place from 9-19 November 2020, in Glasgow, UK, will take place from 1-12 November 2021, still in Glasgow.

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences etc.

Research and Information System for Developing Countries
Core IV B 4th Floor, India Habitat Centre, Lodi Road, New Delhi 110003, India
Tel:-011- 24682176, E-mail: science.diplomacy@ris.org.in
Website: www.fisd.in