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COP 26: Major outcomes on Methane, Coal and Deforestation

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by Rashmi Ramesh, Keerthana Nambiar and Akriti Sharma



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The NIAS Fortnightly on Science, Technology and International Relations (STIR) is the new initiative of the Science, Technology and International Relations Programme at the Institute. To know more about STIR, or if you would like to contribute, write to Prof D. Suba Chandran, Head, Science Technology, and International Relations Programme.

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COP 26: Major outcomes on Methane, Coal and Deforestation

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I The Agreements

Global Methane Pledge

On 2 November 2021, the second day of the COP26, the US and the European Union jointly launched the Global Methane Pledge, an agreement to reduce the methane emissions by 30 per cent from 2020 levels, in the next ten years. Over 100 countries are signatories to the pledge, representing approximately 50 per cent of all the methane emitted.

The pledge was jointly proposed by the US and the European Union in September 2021 as a primer to the possible expectations from the COP26 to be held in November at Glasgow. Under this, signatories agree for the following: first, to reduce anthropogenic methane emissions by at least 30 per cent below 2020 levels. Second, to focus on national commitments to meet the target, and particularly concentrate on energy, agriculture and waste sectors. Third, invest in technology and innovations in forms of partnerships and incentives. Fourth, support other methane-related international initiatives and the International Methane Emissions Observatory. Fifth, maintain transparency, conduct annual progress reviews, and encourage private participants to take voluntary actions towards cutting methane emissions. (“Explained: What is the Global Methane Pledge, and why is methane significant for climate change?”, *The Indian Express*, 03 November 2021) (“About the Global Methane Pledge”, *Global Methane Pledge*)(“Global Methane Pledge”, *Climate and Clean Air Coalition*, 2021).

Global Coal to Clean Power Transition Statement

On 4 November 2021, 23 countries made new commitments to 'phase-out coal.' In the new agreement 'Global Coal to Clean Power Transition Statement', 40 countries are set to transition away from coal to clean energy. China, India, and the US, the largest coal-using countries, did not sign-up for the agreement. By the end of 2021, major international banks have committed to effectively end financing to unabated coal power.

Alok Sharma, COP26 President said:“the end of coal is now within sight. Securing a 190-strong coalition to phase out coal power and end support for new coal power plants and the Just Transition Declaration signed today, shows a real international commitment to not leave any nation behind...together we can accelerate access to electricity for more than three quarters of a billion people who currently lack access, consigning energy poverty to history as we create the clean power future needed to keep 1.5 alive.” The UN Secretary General Antonio Guterres said: “it is time to go into emergency mode. The climate battle is the fight of our lives and that fight must be won” (“End of Coal in Sight at COP26,” *United Nations Climate Change*, 4 November 2021;“Global coal to clean power transition statement”, UNFCCC, 4 November 2021).

Glasgow declaration on forests and land use

On 2 November, at COP 26, the world leaders signed the ‘Glasgow declaration on forests and land use’. The declaration reaffirmed “respective commitments, collective and individual, to the UN



Framework Convention on Climate Change and the Paris Agreement, the Convention on Biological Diversity, the UN Convention to Combat Desertification, the Sustainable Development Goals; and other relevant initiatives.” It further reaffirmed commitments to sustainable land use, and to the conservation, protection, sustainable management and restoration of forests, and other terrestrial ecosystems.” The pledge includes nearly USD 19.2 billion of public and private funds.

Around 141 countries signed the agreement, including Brazil where deforestation in Amazon has been blatant. Additionally, the Vatican City, Nicaragua, Singapore, and Turkmenistan are the new signatories to the declaration. The signatories together constitute about 90.94 per cent of the forest area. Brazil, Congo and Indonesia, the countries which account for most of the deforestation have also signed the declaration. The declaration aims at the following- first, to conserve and restore forests and other terrestrial systems. Second, facilitate domestic and international sustainable trade policies that do not drive land degradation and deforestation. Third, reduce vulnerability and enhance resilience amongst the indigenous communities and rural livelihood. Fourth, promote sustainable agriculture policies to ensure food security. Fifth, reaffirm financial assistance from the public and private sectors on the above objectives. Sixth, facilitate financial aid with the international policies on deforestation, sustainable land use, climate change and biodiversity. (“[Glasgow declaration on forests and land use](#)”, *UN Climate Change Conference UK 2021*, 2 November 2021).

II Historical Initiatives

Methane

Prior to the Global Methane Pledge, initiatives were largely country or

region-specific and were devoid of a solid agreement to cut down methane emissions. Much of the initiatives have been undertaken by the European Union. The European Commission adopted a strategy in 1996, to reduce emissions from landfills, which halved the methane emissions. In 2020, the European Green Deal adopted a strategy to reduce methane emissions as part of its attempt to cut down overall GHG concentration by 55 per cent in the forthcoming decade.

The Climate and Clean Air Coalition (CCAC) based in UNEP, has been set up with 71 countries and 78 non-state actors as partners. The focus is on the curbing of four major SLCPs and initiatives on waste management, hydrocarbons, and improvement of techniques on agriculture and primary sector at large. CCAC’s Mineral Methane Initiative that deals with reduction of emissions from the hydrocarbon sector, has three projects- Oil and Gas Methane Partnership, the Global Methane Alliance and the Methane Science Studies. Through their implementation, it targets to cut down methane emissions from the energy sector by 45 percent by 2025.

The International Methane Emissions Observatory (IMEO) was announced by the UNEP in March 2021 and was launched at the G20 Summit with support from the European Commission. IMEO was set up based on the CCAC’s Mineral Methane Initiative and it focuses on addressing the gap between data collection and strategic action (“[IMEO History](#)”, *UN Environment Program*; “[Joint EU-US Press Release on the Global Methane Pledge](#)”, *European Commission*, 18 September 2021; “[International Methane Emissions Observatory](#)”, *UN Environment Program*).

Coal

International efforts to phase out coal have always been made, without significant



results. Over the last decades, countries across the world have signed various agreements to slow down global warming with hollow pledges. Kyoto Protocol, 2005 was the first agreement to legally bind countries to act towards climate change requiring developed countries to reduce emissions. But the treaty failed to compel developing countries to take action thus, becoming unsuccessful. Paris Agreement, 2015 is deemed to be the most significant and partially successful pact so far. It requires governments to set targets, submit their achievements, and aim for a global net-zero. Some of the countries acted upon the pledge and made a considerable difference, others failed. (“[Global Climate Agreements: Successes and Failures](#)”, *Council of Foreign Affairs*, 17 November 2021; “[The future of coal in a carbon-constrained climate](#),” *Nature*, 27 July 2020)

Deforestation

The New York Declaration on Forests (NYDF) was adopted in 2014 to restore and conserve the forests. It aimed at reducing 50 per cent deforestation by 2020 and halt it by 2030. 40 countries signed the agreement. It is known as the starting point for global agreements on forests. It was endorsed in the Climate Summit of 2014 and had more than 200 endorsers including non-governmental organizations, civil-society groups and indigenous people along with the private organizations. The participation was limited as major countries like Brazil and Russia were not a part of the declaration. According to the reports, the agreement had not been able to achieve its targets and halt deforestation. The agreement failed to address the deforestation which was happening at an alarming rate. (“[The New York Declaration on Forests \(NYDF\)](#)”, *NYDF*; Mark Kinver, “[World 'losing battle against deforestation'](#)”, *BBC*, 12 September 2019)

III Issues: Methane, Coal, Deforestation

Methane

Methane is a short-lived powerful greenhouse gas, with an atmospheric lifetime of approximately 12 years. According to the CCAC, “short-lived climate pollutants (SLCPs) are powerful climate forcers that remain in the atmosphere for a much shorter period of time than carbon dioxide (CO₂), yet their potential to warm the atmosphere can be many times greater”. In other words, there is a profound and stronger impact on the biosphere. The four prominent SLCPs—black carbon, methane, hydrofluorocarbons and methane—contribute to around 45 per cent of human-induced global warming.

Studies have proved that methane attracts more radiation and can push the global temperatures despite its short atmospheric lifespan. The IPCC notes that methane’s impact on climate change is recorded as 86 times greater than carbon dioxide in a time period of 20 years, and is responsible for at least 25 per cent of the warming being experienced today.

Naturally, methane is emitted by wetlands and decomposition of biomass, and this accounts for 40 per cent of all the methane emitted. The remaining 60 per cent comes from hydrocarbons, coal mining, livestock rearing, fracking, landfills, agriculture (mostly rice production), and biomass burning. When further specifically categorized, anthropogenic methane emissions are a result of agriculture and livestock rearing (40 per cent), fossil fuels (35 per cent) and waste sector (20 per cent).

Kayrros, a European technology start-up developed a tool to detect and point to the sources of methane from outer space. Scientists combine the data received from Copernicus Sentinel-5P and Sentinel-2,



and using artificial intelligence, accurately point to the source. For instance, Kayrros detected large amounts of methane, around 164 tonnes per hour emanating from the Yamal-Europe pipeline along Russia, Belarus, Poland and Germany, in 2019-20. (“Climate Change 2014: Synthesis Report”, *Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2014; “What are short-lived climate pollutants?”, *Climate and Clean Air Coalition*; “New global methane pledge aims to tackle climate change”, *UN Environment Program*, 2021; “Monitoring methane emissions from gas pipelines”, *The European Space Agency*, 4 March 2021; “Explained: What is the Global methane Pledge, and why is methane significant for climate change?”, *Indian Express*, 3 November 2021)

Coal

Climate change is one of the biggest challenges that threatens mankind. Burning fossil fuels causes the most serious and long-term impacts and when released reacts with oxygen in the air forming carbon dioxide. Carbon dioxide works as a blanket surrounding the earth’s atmosphere thus, heating the planet- global warming. The world witnessed the consequences of global warming with growing risks of floods, droughts, heatwaves clarifying that an unchecked climate change could lead to profound ecological disruption. Cutting down carbon emissions is essential to battle climate change. The process of extracting fossil fuels and burning coal threatens the landscape with a serious loss of habitat, jeopardizes the water bodies with the challenge of spilling heavy metals and radioactive materials in the freshwater and compromising earth’s natural greenhouse effect. Rise in sea-levels, coastal flooding, species loss are the impacts of global warming.

Millions of years of prehistoric organisms, vascular and nonvascular plants, organic inorganic materials, water, oxygen are the components of coal. But the combustion of coal takes a toll on the climate and entire ecosystem. It releases nitrous oxide (N₂O), methane, and sulfur among carbon dioxide (CO₂). These gasses form volatile organic compounds (VOCs) interacting with the ground-level ozone magnifying the ozone layer depletion. Other than the gasses, burning coal produces solid waste consisting of toxic elements like arsenic, cadmium, selenium, boron, cobalt and creates a grave negative impact on the environment. Coal exposes the environment to naturally occurring isotopes and low levels of uranium and thorium impacting flora and fauna of the world. The coal plants use ‘pulverized coal’ technology which grinds the coal, burns it further to form steam and runs it through turbines to generate electricity. (“How Coal Works,” *Union of Concerned Scientists*, 18 December 2017; “Coal as an energy source and its impacts on human health,” *Science Direct*, 2 April 2021)

Deforestation

According to the Food and Agriculture Organization (FAO), deforestation of the world’s forests is increasing at an alarming rate. According to the Global Forest Watch, in 2010, the world had 3.92 Gha of tree cover, extending over 30 per cent of its land area. In 2020, it lost 25.8 Mha of tree cover. Brazil, Russia, Canada, the US, and Democratic Republic of Congo account for 55 per cent of global forests. However, in Brazil, deforestation has taken place at an alarming rate. Forests are sources of 283 gigatons of carbon. According to a report by the Chatham House titled “Rethinking the Brazilian Amazon Sustainable development for a thriving future”, says that the Amazon is switching from being a carbon sink to carbon emitter. The forests are major carbon sinks and have a role to play in



reducing greenhouse gasses. However, deforestation leads to converting the sinks into emitters of the gasses.

Deforestation happens due to various reasons. First, agricultural activities. The increasing demand for food is resulting in high rates of deforestation. Meat and food industry is a major cause of deforestation. According to the Global Forest Watch beef and soy result in increasing rates of deforestation. According to FAO, agriculture leads to 80 per cent of deforestation. Second, urbanization, overpopulation indirectly causes it. Third, illegal logging. Wooden products, infrastructure and paper are some products for which the demand for the wood. Fourth, mining for coal and oil demand increases the demand for the forest land. Fifth, forest fires caused by natural and human-induced factors are also increasing large amounts of forest land.

Carbon is found in several pools in the forests in the form of the vegetation and biomass (35-65 per cent). At the global level, 19 per cent of the carbon in the earth's biosphere is stored in plants, and 81 per cent in the soil. In all forests, tropical, temperate and boreal together, approximately 31 per cent of the carbon is stored in the biomass and 69 per cent in the soil. In tropical forests, approximately 50 per cent of the carbon is stored in the biomass and 50 per cent in the soil.

The process of photosynthesis explains why forests function as carbon sinks, removing CO₂ from the atmosphere. The participation of forests in climate change is thus three-fold. First, they are carbon pools. Second, they can become carbon emitters by deforestation. They serve as CO₂ sinks when they grow biomass or extend their area. (Georgina Rannard & Francesca Gillett, “[COP26: World leaders promise to end deforestation by 2030](#)”, *BBC*, 2 November 2021”; “[Forests and](#)

[climate change Carbon and the greenhouse effect](#)”, *FAO*).

IV Significance and Challenges

Methane

Global Methane Pledge is the first concrete international agreement on methane that brings together countries representing nearly two-thirds of the global economy. If implemented and realized to the fullest, this could act as a game changer in terms of meeting the targets of the Paris Agreement and keeping the warming below 1.5 degrees.

The Global Methane Assessment, a study by the UNEP and Climate and Clean Air Coalition concluded that decreasing anthropogenic methane emissions by 45 percent in the next ten years would help in averting a warming of 0.3 degrees, which can go a long way in tackling the effects of climate change. Alongside, the study also showed it will “prevent 2,55,000 premature deaths, 7,75,000 asthma-related hospital visits, 73 billion hours of lost labour from extreme heat, and 26 million tonnes of crop losses globally.”

Curbing methane emissions is also an effective tool to fight climate change in the short run. In the words of Inger Anderson, the Executive Director of UNEP, “cutting methane emissions is the best way to slow climate change over the next 25 years. The Global Methane Pledge has great potential to increase ambition and improve cooperation by countries”. While immediate and urgent targets are being met, states and businesses are benefitted from the precious time they avail, for reducing carbon dioxide which is a long-term plan.

The Pledge also comes with some crucial challenges. First, though states that are part of the Pledge represent 50 per cent of the methane emitted, major emitters including China, India, Iran and Russia are not signatories, which is a hindrance to the



full realization of the global targets. Second, much similar to other climate-related agreements, the commitments towards the Pledge are voluntary and lack a strong enforcement mechanism. Third, the global economy is under severe pressure due to the pandemic. States and businesses find the need to bounce back and eventually may continue to support practices contributing to climate change. (“[New global methane pledge aims to tackle climate change](#)”, *UN Environmental Program*, 22 September 2021)

Coal

Over the last year, governments all over the world have vouched to make a difference with pledges and promises to reduce the greenhouses and reach the goal of carbon neutrality. Recently, with the active participation of international organizations like the United Nations Framework Convention on Climate Change (UNFCCC) with the Paris Agreement have started taking concrete steps to make visible changes and announce long-term goals. At the recent COP26 summit, the 200 countries accepted the deal to accelerate moves to “phase down” coal. The agreement calls in developed nations to raise funds for under-developed and developing nations for adapting to climate measures. The pledges are to control the temperature rise predicted by 2030 with a target of 1.5 degrees Celsius. The prediction of the rise in global temperature by 1.5 degrees Celsius to avoid the catastrophic effects of climate change. If the temperature reaches the threshold of 2 degrees Celsius, then there will be no going back.

Coal is one of the biggest sources of greenhouse gas emissions. The major challenge of the deal was negotiations of phrasing coal ‘phase down’ rather than ‘phase-out’. The commitments made by the countries to tackle climate change have

not been ambitious enough. Keeping track of the current policies, countries have delivered less than enough without making serious contributions. Despite decades of knowledge on the impacts of coal on the environment, there have been no significant efforts to restrict the power sector from using coal. A billion-dollar industry like coal mining employs millions of people and creates revenues boosting the economies of many countries. The pledges compel countries to limit financing the coal industry’s expansion and coal investments have been slowing down.

The statement only focuses on coal and ignores other fossil fuels such as oil and gas. However, taking into account fossil fuels will help better. (“[Over 40 Countries Pledge at U.N. Climate Summit to End Use of Coal Power](#),” *The New York Times*, 6 November 2021; “[COP26: World agrees to phase out fossil fuel subsidies and reduce coal](#),” *New Scientist*, 13 November 2021; “[COP26: Can the World Slash Coal Use by 2030?](#),” *Council on Foreign Relations*, 10 November 2021)

Deforestation

The declaration is the second step towards deforestation on a global level after the NYDF. However, it has more participation than NYDF. Growing industrialization and globalization has led to reduced forest cover. Even though a little is achieved through such declarations, they are important institutions to restrict deforestation at global level. Such concrete agreements are the first step towards limiting deforestation. A multilevel approach to address national and domestic issues of environmental degradation are significant. It also becomes a channel to provide support to the indigenous communities and link them to the global system of environmental governance. Inclusion of the countries which are the source of maximum deforestation



including Brazil, Indonesia and Democratic Republic of Congo is an attempt to keep a watch globally at their activities resulting in deforestation. Such declarations at the global level are a watchdog for the countries to reduce deforestation. Additionally, such declarations also help in generating little finance from the developed world to keep in check deforestation in the least developed and developing countries.

One of the major challenges of the declaration is its non-binding nature. There is a difference between the global declarations and the practice at the domestic and national levels. The international institutions will have to ensure that such declarations work as watchdogs. Second, the issue of funding. The developing and least developed countries fall short of resources to address issues such as deforestation.

V The Road Ahead

Methane

First, there is a need to address the cycle. Methane is a major source of global warming and climate change and in turn, warming is also responsible for releasing methane. While climate change is resulting in permafrost thaw in the Arctic and other parts of the cryosphere, the thaw itself releases methane held within otherwise.

Second, a focus on reducing methane emissions with existing technologies, capacity and fixing crucial loopholes like leaky oil and gas pipelines, will go a long way. It is necessary to pave the way for efficiency in existing technologies rather than investing in new technology which the developing world has no access to. According to the International Energy Agency (IEA), more than 75 per cent of the methane emissions can be mitigated by efficient use of existing technology, with nearly no additional costs.

Coal

First, coal is the crux of political realities and has become a medium of diplomacy, given that the coal industry is a powerful stakeholder. Governments face a challenge in striking a balance between economic growth and the pressing need to transition away from coal.

Second, costs and viability. A viable coal phase-out strategy demands sufficient funds and investments in alternative energy sources and efficient technology. Under the current climate deal, finance and development banks have pledged USD 20 billion to help governments shift to cleaner energy. The effectiveness of such pledges might be limited.

Third, coal pollution controls. Pollution control technologies have been introduced along with pre and post combustion technologies to capture CO₂. Carbon capture and storage technology captures CO₂ and transports it to a “geologic sequestration” site and is pumped into ground.

The recent agreement is a very small step where a giant leap was required. In order to reach the agreed targets and pledges, governments must strategize to phase-down coal rapidly. With the looming political challenge, perfectly synthesized roadmaps are necessary. Effectively using a combination of techniques and policies and integrating stakeholders into the process is vital for success.

Induction of modern and effective technologies is a necessity. The momentum of achieving the goals can only be accelerated by inculcating technology such as artificial intelligence (AI) and machine learning (ML) in the process. Moving ahead, technology would be a game-changer in solving energy challenges, regulating the ups and downs while transitioning to renewable energy.

The world has to contemplate more partnerships. At the COP 26 Summit, the ‘Global Energy Alliance for People and Planet’ partnerships, Green Hydrogen Alliances were formed for transitioning to cleaner energy and help developing economies to grow.

Deforestation

First, a sustainable approach. To limit deforestation the demand for wooden products and meat needs to decrease. The meat industry and their land use needs to be checked. The governments need to have stringent environmental regulations in place for the same. The development needs to be sustainable.

Second, a multi-level approach. Deforestation and land use needs to be addressed at global, regional, national, sub-national and local level. At the local level, the indigenous communities have played a key role in conserving the forests. Following a bottom-up approach through shifting some authority to the local community in forest management can be effective.

Readings

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In brief

by Harini Madhusudan and Akriti Sharma

The James Webb Space Telescope successful launch

On 08 January, the final wing of the James Webb Space Telescope was deployed. On 25 December 2021, the James Webb Space Telescope (JWST) was launched. The telescope is headed for the Sun-Earth Lagrange Point 2 (L2), which is a gravitationally stable spot that is about 1.5 million kilometers that lies opposite to the Sun. This spot is popular for several other space telescopes like the Planck Space Observatory and the Herschel Space Telescope. The Webb is currently on its 29-day trip to its observing spot as the largest and the most powerful space telescope ever launched.

The JWST is the outcome of a massive collaboration that involves over 200 universities, organizations, and companies across 14 countries and 29 US states. The telescope is the product of international cooperation between NASA, the ESA, and the Canadian Space Agency. The JWST would look at the exoplanets that were identified through the Kepler Space Telescope. The nominal duration of the telescope is five years but the ESA says the goal is 10 years.

According to NASA, the telescope is designed to focus on four main areas. “The light in the universe, assembly in the galaxy in the early universe, the birth of stars and protoplanetary systems, and planets (including the origins of life.)” Once launched, the telescope would initially undergo a series of science and calibration tests that includes sunshield deployment, telescope deployment, instrument turn-on, and telescope alignment. The best images from the telescope are expected to emerge six months after the launch. The JWST’s predecessor, the Hubble telescope, remains in good health and creates the probability of the two telescopes working together in the early years of the Webb.

Though the JWST is the successor of the Hubble Space Telescope, it is believed that the Webb would aid Hubble. It is believed that scientific advancements are all about “standing on the shoulders of giants,” and thus, the JWST goals would be motivated by the results that have been captured by Hubble through the years. Major difference between the James Webb and the Hubble is that the JWST will orbit the sun while the Hubble has been orbiting the Earth, and unlike Hubble which could be accessed and serviced by space shuttle missions, JWST would be too far away to be serviced. The James Webb was slated for launch in 2007, and since then a combination of political hesitancy and engineering/project problems have led to the innumerable delays of the launch. (Elizabeth Howell and Daisy Dobrijevic, [“NASA’s James Webb Space Telescope: The Ultimate Guide,”](#) *Space. Com*, 25 December 2021; Keith Cooper, [“A New Cosmic Dawn,”](#) *Physics World*, 07 January 2022; Jonathan Amos, [“James Webb Telescope extends secondary mirror,”](#) , *BBC*, 06 January 2022)



COVID-19: Omicron is less severe, reveal studies

On 31 December, according to the *New York Times*, a study on mice and hamsters revealed that Omicron is less severe than the previous variants of COVID-19. The variant is less harmful to the lungs and often restricts itself to the upper respiratory system. It has caused reduced difficulty in breathing.

On 26 November 2021, the World Health Organization declared Omicron as a “variant of concern” and it was first found in South Africa and. The scientists have found out that this variant has more than 50 mutations. It was also observed that the variant was more infectious than previous variants but was milder resulting in less hospitalization rates, especially in the vaccinated population.

A consortium of Japanese and Americans have conducted studies on mice and hamsters. It has found out that those infected with omicron had less lung damage, lost less weight, and were less likely to die. Even in the studies performed on the Syrian mice who are known to get severely ill by the previous variants of COVID-19 had mild illness. According to a study performed by a researcher from University of Hong Kong, who studied bits of tissue taken from human airways in 12 lung samples, the researchers found that Omicron grew less than the Delta. A

similar study on the tissues of bronchi found that Omicron grew less than Delta. However, British scientists have found out that Omicron is effectively damaging nasal cells and while breathing they release more virus load through the nose, making it more infectious. According to the *New York Times*, a team of British Scientists have found out that an omicron replicates itself faster in a cell than the delta variant.

Although the virus is highly infectious and has been a major concern for countries like the US and the UK, scientific studies have largely proven that Omicron is less severe and less likely to land people in the hospitals. Lower morbidity rates are a relief for the states. However, in countries with less vaccinated population the variant is more harmful. Unvaccinated population is at high risk. The countries need to fully vaccinate the population and provide boosters to the population. Vaccine inequity is a major concern which has led the less developed countries in becoming breeding grounds for the mutants. (Carl Zimmer and Azeen Ghorayshi, “[Studies Suggest Why Omicron Is Less Severe: It Spares the Lungs](#)”, *The New York Times*, 31 December 2021; Carl Zimmer and Andrew Jacobs, “[Omicron: What We Know About the New Coronavirus Variant](#)”, *The New York Times*, 3 January 2022)

S&T Nuggets

by Akriti Sharma and Harini Madhusudan

CLIMATE AND ENVIRONMENT

The US: Scientist on a two month mission on “doomsday” glacier

On 6 January, thirty scientists from the US and UK took on a two months mission to Thwaites glacier, which is the most difficult place to reach as it is located in Antarctica. The aim of the mission is to study the extent of sea level rise due to global warming. The glacier is as big as the size of Florida and its melt can have a major impact on the sea level. So far, the glacier has already lost more than two feet. The US and UK have a joint mission of USD 50 millions to study Thwaites. The glacier is melting 50 billion tons of ice into the sea. According to the British Antarctic Survey, the glacier will account for 4 per cent of the global sea rise. According to Erin Pettit, a scientist from the Oregon State University, the glacier is melting in three different ways. First, the glacier is melting from below by the ocean water. Second, the land of the glacier is losing its grip from the sea bed and can result in a big chunk coming off into the ocean and consequently melting. Third, the glacier ice sheet is getting fractured. The team will be the first humans to set a foot on the glacier. Two robot ships will be used and the ship-bound scientists will measure the temperature of the sea and thickness of the ice. (Seth Borenstein, “[Scientists explore Thwaites, Antarctica’s ‘doomsday’ glacier](#)”, *AP News*, 6 January 2022)

The EU: Plan to label nuclear and gas plants “green”

On 2 January, the EU Commission proposed a plan to label nuclear and gas plants as “green”. The reason behind the same is that both nuclear and gas have helped in transition. The Commission

proposal said: "It is necessary to recognise that the fossil gas and nuclear energy sectors can contribute to the decarbonisation of the Union's economy," According to the proposal, only gas and nuclear plants with highest standards will be labelled. Nuclear plants will have high waste disposal standards. Germany's Environment Minister criticized the plan. He said that the plan was “wrong” as nuclear energy had major environmental concerns. If the majority of the EU members pass the plan, it would become a law in 2023. (“[EU plans to label gas and nuclear energy 'green' prompt row Published 7 days ago](#)”, *BBC*, 2 January 2022)

The US: Coldest state of America witnesses hot extreme

On 29 December, Alaska recorded the hottest day ever in December. On the island of Kodiak the temperature recorded was 19 degrees Celsius which was seven degrees higher than the previous highest temperature. The authorities have issued a warning of “Icameddon” due to torrents of snow and rain which left the ice as hard as cement. According to the experts, the air from Hawaii has added moisture to the atmosphere in Alaska which led to heavy rain. The heavy rain had foren on the roads in large amounts making it extremely dangerous for the transportation on the road. Such extreme weather are climate alarms. (Jack Hunter, “[Alaska 'Icameddon' warning follows heat record](#)”, *BBC*, 29 December 2021)

HEALTH

Health: Dementia estimations in 2050

On 6 January, *The Lancet* published a paper titled “Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019”. Due to population growth and



aging, dementia is expected to increase in the future. The study aimed at improved forecasts of dementia through country-level estimates. The study estimated that the cases of dementia will increase from 57.4 million cases in 2019 to 152.8 million cases in 2050. As of now, women are found more prone to the disease than men and this trend is likely to continue in future. According to the projections, Asia-Pacific will on an average have an increase of 53 per cent, western Europe 74 per cent, North Africa and Middle East 367 per cent and eastern sub-saharan Africa will account for an increase of 357 per cent. Addressing the surge in dementia cases will require meticulous public health planning. Country based projects can help the countries plan their own policies. However, a multifaceted approach is needed to restrict the disease. ([“Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019”](#), *The Lancet Public Health*, 6 January 2022)

The US: COVID-19 may increase risk of diabetes in children

On 7 January, the Centers for Disease Control and Prevention, children who have recovered from COVID-19 are at higher risk of developing Type 1 and 2 diabetes. Adults recovered from the virus are more prone to diabetes according to the studies. In the UK post pandemic it is found that the children are also at risk. CDC is among the first ones to study diabetes risk in children below the age of 18 who recovered from the virus. Children who recovered from COVID-19 were at 30 per cent higher risk than those who did not have the COVID-19. According to the study it is important for the children to get vaccinated. (Roni Caryn, [“Covid may raise the risk of diabetes in children.](#)

[C.D.C. researchers reported.”](#) *The New York Times*, 7 January 2022)

SPACE

The US: Space Force expected to use the navigation from the commercial LEO satellites to understand radio-interference

On 4 January, the US Space Force awarded a USD 2 million contract to Slingshot Aeronautics, to develop an analytics tool, with a plan to use location data from commercial satellites in the Low Earth Orbit (LEO) to identify potential sources of electronic interference on the ground. Many experts call it an attempt by the US military to take advantage of the telemetry data available from the numerous commercial satellites in the LEO. The Space Force stated that the Slingshot Aerospace would “develop a prototype that utilises proliferated LEO mega-constellations to detect, locate, and mitigate radio frequency, and GPS interference sources, which are direct threats to the US on-orbit space assets.” The contract is funded by the Space Systems Command’s CASINO program, which is said to be created to figure out ways to use new space technology by the military: “commercially augmented space inter-networked operations.” The US Space Enterprise Consortium was launched in June 2021, and the above contract was part of a competitive opportunity launched by them. (Sandra Erwin, [“Space Force to use navigation data from LEO constellations to detect electronic interference.”](#), *SpaceNews*, 6 January 2022)

Artemis 1: Callisto to test Amazon’s Alexa Technology

On 5 January, Lockheed Martin announced that it has been working with Cisco and Amazon on a project named Callisto that would fly on the Artemis 1 mission that is



expected for March 2022. The project is a demonstration to see how Amazon's Alexa and Cisco's Webex platforms could be used on future crewed missions. The system is expected to use the same version of Alexa technology available to consumers. These systems would control the lighting and displays in the spacecraft and also possess the ability to start diagnostic tests for spacecraft systems. The companies have announced that Callisto has been tested extensively in simulators and are confident in its ability to fly. In late 2018, Lockheed is said to have signed a Space Act Agreement with NASA to support the testing and inclusion of the Callisto on Artemis 1 and paid for all the costs associated with that work. (Jeff Foust, ["Amazon's Alexa to be tested on Artemis 1,"](#) *SpaceNews*, 5 January 2022)

TECHNOLOGY

India: Google faces an antitrust inquiry in India

On 7 January, the Competition Commission of India ordered an investigation into Alphabet's Google following allegations by new publishers that claimed Google had broken some antitrust laws. In its order, the Competition Commission revealed that it believes Google has broken some antitrust laws. The complaint was raised by the Digital News Publishers Association which is made up of the digital arms of India's biggest media companies, who claimed that Google denied fair advertising revenue to its members. Taking examples from the new rules in France and Australia, the CCI order said: "It appears that Google is using its dominant position in the relevant markets to enter/protect its position in the market for news aggregation service," while news organisations have been losing advertising revenue to them. (By Reuters, ["Google](#)

[Faces Antitrust Inquiry in India after News Publishers Complain,"](#) *NDTV*, 8 January 2022)

CES 2022: More promising technology amid the pandemic

From 5 January to 8 January, the Consumer Electronics Show (CES) is the world's largest annual trade show organised by the Consumer Technology Association. The two highlights of this year's event were the heavy focus on Electric Vehicles, and on the Metaverse. The year saw more than 2200 firms including smaller companies and start-ups participate in a hybrid setting. The gathering was significantly downsized after the increase in the cases globally, however, many companies participated virtually. The surprise element was Sony announcing their PlayStation and an Electronic Vehicle at the event. The event witnessed some ground-breaking and unique technologies emerge such as brain tech (that allows users to access technology through thoughts), autonomous vehicles for agriculture and the seas, and steady robotic technologies. (AFP, ["Best of CES 2022,"](#) *Economic Times*, 8 January 2022; Shweta Ganjoo, ["How metaverse, TVs stole the spotlight in Las Vegas,"](#) , *BGR*, 8 January 2022)

North Korea: New hypersonic weapon tested

On 5 January, North Korea announced the successful completion of its new hypersonic vehicle, the announcement of a second test in three months. The vehicle is said to have precisely hit its target 700 kilometers from its launch site after a 120-kilometer lateral maneuver. In September 2021, the nation tested its first-ever hypersonic mission which involves a missile called the Hwasong 8, which is said to be entirely a different type in comparison to the recent test allowing the likelihood of the assumption that the



nation has authorized more than one development programs for the same. Maneuverability is the highlight of hypersonic technology. If the statement by the Korean Central News Agency is true, and the accuracy announcements are reliable, it is very likely that the North Korean Hypersonic technology would beat the hypersonic capabilities of the US. The statement reads: "The test launch clearly demonstrated the control and stability of the hypersonic gliding warhead, which combined the multi-stage gliding jump flight and the strong lateral movement." (Mike Wall, "[North Korea Tests another new hypersonic weapon.](#)", , *Space .com*, 7 December 2022)

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