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COVER STORY 01

Ukraine-Russia War: A Politicised International Space Station

Based on the statement by the new Chief of ROSCOSMOS of the Russian intention to exit the ISS after 2024, the NASA plans to extend the life of ISS to 2030, and the fact that the ISS is nearing the end of its lifecycle, here is a background of the symbolic relevance of the ISS in the context of terrestrial geopolitical tensions.

By Harini Madhusudan



Photo Source: NASA

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COVER STORY

Ukraine-Russia War: A Politicised International Space Station

Based on the statement by the new Chief of ROSCOSMOS of the Russian intention to exit the ISS after 2024, the NASA plans to extend the life of ISS to 2030, and the fact that the ISS is nearing the end of its lifecycle, here is a background of the symbolic relevance of the ISS in the context of terrestrial geopolitical tensions.

On 26 July, the newly appointed chief of ROSCOSMOS made a statement in the presence of President Putin, that Russia may not continue its activities with the International Space Station after 2024 when the current agreement expires. He said: "Of course, we will fulfill all our obligations to our partners, but the decision to leave this station after 2024 has been made. I think that by this time we will begin to form the Russian orbital station." Following this, the rest of the world, with the US especially, expressed their shock and regret over the Russian statement, as it would bring to a halt over two-decades scientific and professional cooperation among advanced space powers. In the days following the statement, it was mentioned that the announcement meant that Russia planned to leave the International Space Station after its Orbital Space Station is up and running. They say that the message by the chief was lost in translation and that it would likely be 2028 by the time the Russian station is up and running.

The International Space Station is scheduled to be de-orbited by the year 2031. In January 2022, before the start of the war in Ukraine, it was revealed that NASA and ROSCOSMOS were in talks about extending the operating agreement of the ISS until 2030. However, after the war began, several instances related to cooperation in Outer Space took a hit. By 28 July, the US passed the CHIPS and Science Act of 2022, named the Creating Helpful Incentives to Produce Semiconductors, that included a NASA authorisation bill that officially extends the US participation in the ISS Program up to 2030. Hence, the last week of July was

surrounded by speculations and incoherent communication regarding the International Space Station. The important question is, however, about the aspect of the International space station in situations of terrestrial contention, specifically the War in Ukraine. What is the timing and significance of the Russian statement on ISS? What is the importance of the ISS for International collaboration in the International Space Station in the 2020s? Has the ISS been politicised in recent years?

I

Fallouts from Terrestrial Tensions

The primary challenge for ROSCOSMOS is the constrain in the inflow of technology supplies/imports that have been affected by the sanctions that have been placed. Additionally, the costs of the war have inversely affected the funding in recent years. This bleak future is partly due to the tensions with NATO and a drain of its resources. Shortly after the sanctions on Russia in late February, ROSCOSMOS announced the suspension of its Venus exploration mission with NASA, and over the months of the war, ESA called off its participation in the Russian Moon and Mars missions.

Since the war, there were four particular incidents that stood out for all space observers. First was the tensions surrounding the ride-sharing between US and Russia in the weeks after the war began, the second incident was the cancellation of a launch agreement between OneWeb and ROSCOSMOS due to the Russian precondition that the spacecraft would not share data with the



UK and that the British government divests its entire stakes in the company. The third political highlight was the Russian cosmonauts displaying the flags of the Luhansk region after Moscow announced that the region was captured. The fourth was when the planned ExoMars mission between ROSCOSMOS and ESA was delayed, in the context of the ongoing war.

Russia then lost its launch contracts in Kazakhstan at the Baikonur Cosmodrome spaceport. In the case of rides to the ISS, unlike depending on the Soyuz rockets, NASA now works with SpaceX and Boeing for rides to the ISS, which marks an end to the significant revenue inflow for the Russian program.

II

Significance of the ISS

The International Space Station is a symbol of scientific and political cooperation amid the cold war tensions. The station has been known for its sustained cooperation despite the growing terrestrial tensions between Russia and the West in the past decades. Russian and western countries have collaborated in Space despite the terrestrial flare-ups. As a successor to the 1995 Russian Space Station Mir, the International Space Station was launched in 1998 with the Russian Orbital Segment and the United States Orbital Segment. The Orbital segment under the US name is jointly operated by NASA, JAXA (Japan), CSA (Canada), and the ESA (Europe).

The International Space Station involves activities that have numerous connections between the two segments, and interdependence of software systems. Major countries participating include Russia, and the US, (who remain the main players) along with the active role of Europe, Canada, and Japan. Currently, each segment of the station is interdependent and due to the same reason,

the US orbital segment and the Russian segment are incapable of operating independently. Simultaneously, China has been seen assembling its Orbital Space Station, and Russia has announced plans for its Space Station. Following the sanctions during the 2014 Crimean tensions, ROSCOSMOS began to move closer to China's Space Program. Both Russia and China have also announced their Lunar Space Research Station in the upcoming years. Hence, the geopolitical tensions have flown into the activities of Outer Space at a time the domain is seeing a transition. Unlike the Cold War times, the number of players in Outer Space has increased and now sees the active participation of private companies.

In the likeliness of the Russian components of the ISS becoming inoperable, detached, or discontinued, the immediate problem would be the problem of maintaining its orbit by boosting the complex. Though it is possible to keep the station running if Russia discontinues, logistical issues of maintaining the ground communication systems will remain.

III

Politicising Outer Space

During the war, it has been reported that there were instances of GPS jamming, the jamming of Starlink access, the cyberattack of ViaSat ground terminals, and the jamming of communications. However, these attacks have not been identified as cyberwarfare yet. Commercial satellites have also been actively involved in the war with US-based companies such as Maxar and Planet providing satellite imagery services, or radar imagery companies like Capella Space providing real-time access to military data. These tensions have fallen into the dynamics that made continuing cooperation in the ISS dicey.



The statement by the new Chief of ROSCOSMOS was made at a time when the visible signs of the Russian station is at a nascent stage. Though the parties to the ISS have shown intent of extending the activities on the Space Station until 2030, many initiatives have shown signs of countries and private companies working towards their individual space stations. The US for example has been working with commercial space companies to establish their own private stations that would replace the ISS. The political implications of the statement highlight these trends that have been brewing in the past years. Individual orbital stations are a natural transition in the future of research activities in Outer Space. The symbolic relevance of the International Space Station must, however, be upheld despite the terrestrial tensions.

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About the author

Harini Madhusudan is a doctoral scholar at NIAS. Her doctoral research is on the

issue of militarisation in outer space. As part of the Europe Studies at NIAS, her research focuses on Russian geopolitics and diplomacy along with a coverage of the European Islands & Oceans. She particularly researches issues relating to science and technology such as new innovations, outer space, and cybersecurity.

COVER STORY 02

Heatwaves in Europe

Heatwaves will become a more frequent in Europe and other regions, according to the estimates. However, this year's heat intensity exposes the fault lines in implementing sustainable heat action plans and Europe's incapability to deal with the impact of extreme temperature.

On 19 July, the UK recorded its highest temperatures ever, crossing 40 degrees Celsius. Parts of France, Spain, and Portugal recorded high temperatures between 42 and 46 degrees Celsius. On 20 July, Germany's hottest day of the year was recorded at 40.9 degrees Celsius. While the heatwave had started in southern and Western Europe, it is moving eastwards. Over the last few days, in the Netherlands, Poland, Italy, and Slovenia, authorities have issued heat warnings. This is not the first time in the year that Europe is experiencing heat waves. In May 2022, France registered temperatures higher than the historic average. In June 2022, the southern part of Europe experienced another heatwave, which spread from Spain to Turkey.

I

Causes behind the persisting heatwaves

There are a few factors that are contributing to the recent heatwaves in Europe.

First, Europe's highest average temperature in comparison to the global average. Europe's average temperature is now 1.94 to 1.99 degrees Celsius hotter than in pre-industrialization times. This is almost double the global average of 1.1 degrees. As a result, of this, the extreme heat starts from a higher point. To address the rise in temperature, the Intergovernmental Panel for Climate Change (IPCC) has mandated member states to cap the global average temperature rise to 1.5 degrees Celsius. IPCC said that while the damage that has already been done will have a prolonged

effect on the global climate, the 1.5 cap is necessary to avoid the worst effects of the same.

Second, the high-pressure system called the Azores High. This high-pressure zone usually stays over Spain, but this year, it has grown and pushed further north. It now covers the entire Iberian Peninsula. As a result of this high pressure, the low-pressure zone off the coast of Portugal is steadily drawing hotter air from the North African regions toward Europe.

Third, a connection between the heatwaves and the splitting of the jet stream current into two has been established. The jet stream is a giant ribbon of fast-flowing air that circles the Northern Hemisphere. Because of the split, an area of weak winds results in the build-up of heat between the two branches.

Fourth, changes in the ocean current called the Atlantic Meridional Overturning Circulation (AMOC). The AMOC, which has turned sluggish generally shuttle warm water northwards, and cold water southwards.

II

Impact of the Heatwaves

First, the compound events. As a result of the heat, the rate and extent of wildfires and droughts have increased. Wildfires have erupted in Portugal, Spain, France, the UK, Greece, and Poland. Over 5,15,000 hectares of land have been burnt across the EU countries. Thousands of people across Europe have been evacuated



to temporary shelters. Portugal reported more than 3,000 hectares of wildfires, across 250 blazes over a period of two days. The burnt area was the largest since 2017. Spain lost around 14,000 hectares to fires, in 30 blazes. Its reservoirs are also at 44.4 per cent of their capacity from 65.7 per cent in the last decade. Wildfires have also destroyed over 24,000 hectares of forest in southwestern France, where more than 1,200 firefighters struggled to curb the blazes and 37,000 people have been forced to evacuate. The water level in Italy's longest river, the Po, reached record low levels after no rainfall for more than 200 days. Moreover, the Marmolada glacier in the Dolomites melted unexpectedly, which killed 11 people due to the resultant avalanche. In Greece, rising heat, along with strong winds have resulted in the quick spread of wildfires. Blazes were seen to the southeast of Athens. Fires also broke out near London, where over 40 houses were destroyed. Moreover, in Europe, glaciers are reportedly melting earlier due to the heat. Warnings have been issued for around 12 peaks in the Alps, to deter climbers from taking routes prone to melting, thawing permafrost, and falling rocks. Smaller-scale fires were reported in Poland, Hungary, Croatia, and the Czech Republic too.

Second, worsening public health. High temperatures reduce air circulation and lead to an increase in air pollution. This worsens respiratory issues and increases the risks of heatstroke, heat exhaustion, and other forms of hyperthermia. Reportedly more than 659 deaths were reported in Portugal and an estimated 360 people in Spain succumbed to extreme heat. This is probably because extreme heat also exacerbates pre-existing health conditions, making infants, children, and older people more vulnerable. Moreover, Europeans are less acclimatized to such extreme heat and thus miss the warning signs of ill-health caused as a result of it.

Third, the impact on the economy. Heatwaves take a toll on productivity in countries not used to such extreme temperatures. The International Labour Organization (ILO) predicts that by 2030, the number of hours worked globally will reduce by 2 per cent. To put that in perspective, that is equivalent to 80 million full-time USD 2.4 trillion. A study published in Nature Communications said found that heatwaves have lowered the overall annual GDP growth by 0.5 per cent on average in the past decade. While the current heatwave in Europe is still ongoing, given its intensity, it is bound to impact the economy adversely.

Fourth, impact on the infrastructure. Many European cities are not designed to withstand such high temperatures. In some places, roads melted, and rail tracks buckled, majorly disrupting traffic. These cities also do not have the infrastructure to keep people cool, and that has added to the crisis. European buildings most of which are not equipped with air conditioners also do not have fans. They are built to trap heat in order to help residents better withstand the bitter cold. This has caused indoor temperatures to soar during a heat wave, turning these cities into "urban heat islands." 72 per cent of the population in the European Union live in cities, towns, and suburbs, concrete, glass, and steel in urban environments. The relative lack of green spaces made it more difficult for the Europeans to deal with the heat.

Fifth, the negative impact on agriculture. The prolonged heat and the decrease in rainfall, coupled with drought-like conditions in several countries across Europe have led to a reduction in agricultural output. The Po Basin supports one-third of Italy's agricultural production, but the low levels of water are affecting the cultivation in the basin, especially of tomatoes, corn, and rice. AP News reports that Italian farmers have lost approximately USD three billion due to



the current drought. Given the food security crisis resulting from the war in Ukraine, and the fact that nearly half of Europe is under a drought warning, an acute crop shortage can be anticipated in the future.

Sixth, increase in energy usage. With increasing heatwaves this summer, Europe's energy requirements have increased at the wrong time, given their sanctions on Russian energy. While Europe has aimed to cut down emissions and invest heavily in renewables, this shift has also been disrupted by the war in Ukraine and the impending energy crisis.

III

Responses to the heatwave

First, the state responses. Most of the states have declared red alerts due to the extreme heat. The UK called an emergency Cabinet meeting to discuss Britain's first-ever "Extreme Red" heat warning. Trains and flights functioned at a lower rate due to fears of expanding tracks and melting runways. Free water points were created and an emergency was declared for rough sleepers. In France, city councils made museums and other air-conditioned places free of charge, and extended pool opening hours. Over 3,000 firefighters, assisted by rescue forces from Greece, and six 'water-bomber' aircraft were also been deployed to tackle the wildfires. In Portugal, more than 1,400 firefighters were in action at 44 fires while in Spain they were struggling to control the active blazes too. In terms of existing crisis management mechanisms, the European National Heat Health Action Plans (NHHAPs) are present in the European countries, but the roles and responsibilities of the stakeholders should be better defined to improve implementation. Moreover, a cross-sectoral approach has to be included to make these plans effective.

Second, is the regional response. In 2003, an intense heatwave in Europe killed over 70,000 people. Since then, the EU has tried to build capacity. In keeping with the Paris Agreement, the EU and the respective governments have outlined plans like the European Green Deal and the European Union Emission Trading System. However, long-term heat action plans have not materialized. While the member states are committed to shifting to green energy, the process or rate has not been as swift or efficient as necessary. Measures have been discussed in theory, but in practice, Europe lacks preparedness. Moreover, the EU's bid to convert to green energy is facing a roadblock due to

Third, the international response. The World Meteorological Organisation has issued a warning saying that this is a "foretaste of the future". They have linked the heatwaves as a direct consequence of global warming and climate change. They maintain that heatwaves will become more frequent and more severe because of concentrations of greenhouse gases in the atmosphere. In order to deal with the crisis, governments need to demonstrate their genuine willingness to implement the global Paris Agreement instead of being divisive and promoting empty rhetoric. The COP26 Health Programme was also adopted last year to coordinate the response by health systems to fight against climate change. The UNEP has developed a Six-Sector Solution to reduce emissions, which in turn is likely to stop the rising of temperatures. On 18 July, at the Petersburg Climate Dialogue UN Secretary-General Antonio Guterres, issued a warning about the imminent dangers of such climate irregularities. He said it is time for either "collective action or collective suicide".

IV

Heatwaves: The way forward

Heatwaves have increased globally and regionally both. Europe, North Africa, the

middle-east and Asia also saw a rise in temperature to above 40 degrees Celsius, showing a global rise in the phenomenon. Extreme heat in the Indian subcontinent preceded the one in Europe. Even though high temperatures are quite common in the region, India saw the hottest March since record-keeping began 122 years ago. Pakistan on the other hand registered the hottest March in the world. In China, three separate heatwaves were recorded which resulted in buckled roads, melted tar, and tiles popping off the roofs. On 13 July, the Shanghai Xujiahui Observatory recorded its highest temperature ever at 40.9 degrees Celsius. Red alerts were issued in cities across the Yangtze River Basin. Across the US, the National Weather Service issued heat advisories and warnings to over 100 million people. In late June, temperatures reached 52 degrees Celsius in Iran, while in Africa, Tunisia reached 48 degrees Celsius, breaking a 40-year-old record.

Thus, there is an emerging trend in the increase of extreme heat related events across the world. Forecasts say that such events will increase in frequency and intensity. To tackle the rising cases of heatwaves, the European countries need rapid climate action and adaptation. Early-warning mechanisms need to be further developed. Europe also needs to design their infrastructure in a way that can sustain extreme heat.

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About the author

Rishma Banerjee is a Research Assistant in the Science, Technology, and International Relations Programme under the School of Conflict and Security Studies at the NIAS and she works in the KAS-NIAS Europe Studies Programme. Her research interest is in the geopolitics of Eastern Europe and she is currently profiling migration from the middle east to Europe.

COVER STORY 03

UN Ocean Conference 2022: A critique

UN Ocean conference highlights the need to align the challenges to the ocean health with SDG14, but fails to address the effects of aquaculture and deep sea mining.

On 27 June, the UN hosted the UN Ocean Conference in Lisbon. Since the UN declared the decade (2021-2030) as “Ocean Science for Sustainable Development,” France followed by Kenya and Portugal have become the forerunners of the initiative by co-hosting the “One Ocean Summit,” in Brest from 09 to 11 February and “the UN Ocean Conference”. The Ocean Conference held dialogues looking into marine pollution, protection of marine ecosystems, ocean warming, and linking of SDG goal 14 and 2030 ocean agenda. It also focused on the impact of climate change due to human activities in the ocean, the challenges faced by ocean-based economies from the hindrances in ocean monitoring due to pandemics, restoration of ocean health, and sustainable ocean economy. A total of 150 participant countries together agreed to adopt the Lisbon Declaration on “Our ocean, our future, our responsibility” to prioritize conserving oceans through linking with SDG-14 and bringing back the “General Assembly resolution 73/292 of 9 May 2019” in line with SDG.

On the earth’s surfaces, land and water resources have been exploited beyond for the survival of the human population, but when it comes to natural restoration, the oceans take the lead over land resources. While the vastness of ocean habitat and its true potential for human lives are yet to be discovered, the ill effects of unsustainable living methods have begun to erode the health of the oceans. The increasing threats to the ocean environment have provoked countries and international organizations to come forward to unite towards the one ocean cause.

I

Marine Pollution and the problem of plastics

Increasing marine pollution has affected human health, marine ecosystems, fisheries, and agriculture pushing for the need to align prevention methods and SDGs to address all forms of pollution. To do that, it is important to not only map sea sources but also land to know the start point or the extent of pollutants. More than 3.5 billion people are directly dependent on the ocean for basic food but are affected by land-based activities which account for 80 per cent of pollution through untreated sewage, radioactive waste, marine litter, dumping of plastics, the building of harbours, agricultural run-offs into marine bodies and accumulation of solid waste. With the intervention of the pandemic, the waste collection from the ocean was neglected, and plastic regulations were laid-back threatening the ocean health and endangering marine species. According to UNEP, 11 million tonnes of plastics are dumped into the ocean every year which incurs USD 13 billion for the economy in form of clean-up.

The conference identified a few probable areas of partnership, which include new opportunities and sponsorship for commercial research partnerships, spreading awareness through campaigns such as Clean Seas, and #BeatNitrogenPollution, and continuing the critical efforts of WMO, IEA, IMO, and Intergovernmental Oceanographic Commission to support SIDS and LDC’s in responding to marine pollution.

Plastic pollution

The conference highlighted the transformation of plastics which must shift



from being linear to circular. Emphasis was also laid on banning recyclable plastics and bringing innovation to recycling. The effect on marine life such as dolphins, turtles, and saltwater crocodiles due to the dumping of plastics in the oceans and seas was discussed. According to UNDP 89 per cent of plastic litter found in marine bodies was single-use plastics. The most important recommendations made toward the “New Plastic Economy Global Commitment” were on installing more recycling units and continuous negotiations with global countries to bring all under a legally binding agreement. New Plastics Economy Global Commitment, UNEP head spoke on how the UN seeks to bind all countries into the commitment by aligning the vision and including private and government units. The UN has achieved 500 signatories now more have stepped forward after the one ocean summit. Kenya which started the plastic ban in 2007, has now progressed in pushing 19 waste management companies to be held responsible for producing and import of plastics. As far as Australia is concerned the plastics in the ocean have affected the marine species vastly and the government proposed to raise USD 800 million to invest in recycling infrastructure and encourage its university to innovate new ways to suck carbon dioxide and make plastics 100 per cent reusable. Apart from the existing countries, Sao Paulo, Brazil, the Federal government of Belgium, the Kingdom of Thailand, the government of Mexico, along with several other Brazilian and Mexican states joined the Global commitment to plastics.

II

Blue carbon

Decades of action have been taken towards bringing the carbon emission down on the earth's surface, the damage done to the ocean surface also contributes to the release of carbon into the atmosphere. The marine ecosystem includes the mangrove

forests, salt marches, and seagrass, even if they are in one per cent proportion of the ocean, they can store 50 per cent of the carbon accumulated for millenniums. Therefore, when such ecosystems are disturbed by human activities, they lose their tendency leading to the release of “sequestered” carbons that have remained in for centuries. Such marine systems can be turned around for the benefit of humanity by cultivating them and protecting them which can promote carbon-free oceans, lessen the climate change effects, and avoids the loss of wetlands, and vegetation.

The representative from Conservation International, a non-governmental organization highlighted how the marine systems are 35 times better at acting as carbon syncs when compared to tropical forests. Its significance to humanity not just ends with combating carbon but also in protecting against violent storms, promoting marine life, and wave action. With regards to the blue carbon coalition, Executive Director, AFD (French Development Agency), Gilles Kleitz vowed for adopting a higher ambition to protect the “carbon-rich marine ecosystem” and ensure commitment from banks to source in 200 billion under “carbon finance and ecosystem restoration.” Colombia’s Minister of Environment and Sustainable Development presented the progress of Colombia’s first blue carbon project on the Caribbean coast certified by Verra, a blue carbon group that has targeted sequestering one million tonnes of carbon dioxide in 30 years' time. The project has benefitted more than 400 families living in the area after six years and the Colombian government assured to start similar projects along Indo-Pacific Coast soon. As far as Indonesia, has implemented a “Blue economy development policy” which aims to the protection of marine areas, increase effectiveness, and “empowering of local communities.” Australia committed to

initiating five blue carbon projects at the domestic level to promote carbon sequestration and biodiversity. It also plans to double the indigenous population as it values their traditional care towards the conservation of land and sea. On the same line the NGO, Conservation International head proposed to encourage and promote the living of the Afro-defendant population who are found to be contributing less to climate change effect but support the most in mitigation.

III

Ocean-dependent economies

Threats faced by people living in coastal areas especially the Small Island Developing States (SIDS) and least developed countries are the increasing population and depleting fisheries. According to IPCC, 680 million live in such ocean-dependent areas and SIDS counts the biggest share of 65 million. As per UN Global Compact, 50 per cent of people in LDCs depend on fisheries for basic protein and generate 57 million jobs. In the pre-pandemic period, SIDS and LDCs began to realize the criticality of the oceans in food security, employment, nutrition, and culture. The pandemic aggravated the existing threats leading to economic consequences. Hence under the 2030 agenda, strategies such as “build forward better” can induce to create growth and promote jobs through green and blue industries. Through this, the SIDS Accelerated Modalities of Action (SAMOA) Pathway (Samoa Pathway) can be prioritized by aligning with SDG 14 goal.

In terms of tourism, maritime transportation, sustainable aquaculture practices, and deep-sea mining are seen as opportunities for the SIDS and LDCs to remodel their structure in the post-pandemic. Tourism which is an important foreign revenue sector can be a shift to sustainable tourism, by invoking corporate sustainable practices to preserve

nature and inculcate human resources to maintain. This can be applied mainly to the Pacific region which accounts for 90 per cent of tourism. Similar to tourism, the marine transport sector was also affected due to pandemics, which increased freight and cut down on shipping connectivity leading to a financial crunch. Aquaculture and deep sea mining, are viewed as potential areas to cultivate fishes sustainably and extract minerals (Polymetallic nodules, polymetallic sulfides, and cobalt-rich ferromanganese crusts), enhance economy, address poverty, and hunger, and utilize the resources. Cook Islands, Jamaica, Kiribati, Nauru, Singapore, and Tonga have attained development at varying levels in deep-sea mining with guidance from the International Seabed Authority. Continued practice of aquaculture and mining can endanger fisheries and increase marine pollution levels.

IV

Linking Sustainable Development Goals

For the array of challenges present for the ocean in form of pollution, ocean-based economies, sustaining blue carbon, the invention of new technologies, capacity building, and ensuring finance to meet, syncing all under SDG-14 would require sincere commitment and coordinated efforts from every state, regional and international actors. Most importantly, implementation of ocean governance across the north-south is required for attaining the SDG-14 goal. Therefore, the conference mandates the use of “scientific knowledge and evidence-based policy options,” to address the challenges to ocean conservation and enforce the links with SDG -14.

V

Critique

First, the actors in the conference. Unlike the one ocean summit, the UN ocean conference involved all-tier countries, with



special host status for Kenya and Portugal. Kenya's partnership with the EU to work on its blue economy under three programmes, "Go Blue Growth" which looks into creating new jobs, and "Go Blue Environment" to ensure practices are sustainable for the coastal urban and marine environment. "Go Blue Security" to expand a sustainable livelihood and awareness amongst coastal communities shows the growing inclusiveness of the global agenda for Oceans. Apart from Kenya, the Brazilian government presented its initiative on conducting a survey to look into people's direct engagement with the Ocean which could serve as a model to analyze the community involvement and its impact on the oceans. Africa's Union Commission co-organized an event as part of the conference on Africa's sustainable blue economy highlighting the dependency of 38 AU member states who are coastal or island and how their marine resource are affected by anthropogenic sources. By the end of the event, AU proposed modernizing traditional ocean sectors, utilizing its blue resources to boost its economy through partnership, and aiming to establish Africa's Ocean agenda. Therefore, unlike the other global events, the need to ensure the health of the ocean of tier three countries was prioritized.

Second, aquaculture is not a sustainable option. To prevent overfishing and to protect the marine species, the conference recommended the practice of offshore farming and aquaculture as sustainable ways of producing fish for human consumption. Although such methods help beat the increasing food demands of the growing population, when it comes to marine conservation, the depth of such farms, the foreign matters released into the waters, the increase in marine traffic, and to supply of feed for the farmed fishes threatens the environment and the species present in the farm zone.

Third, deep-sea mining is a threat and not a benefit to the ocean. The ocean-based economies see the extraction of mineral deposits through deep-sea mining and seabed mining as innovative areas for boosting their economies. Such mineral extractions which are rich in copper, zinc, gold, iron, and cobalt are allowed under the regulations of the International Seabed Authority. But the extraction is a rigorous process and involves high-end machines, the affordability factor might not be in favor of LDCs and SIDS. Apart from the financial limitation, the extent of damage caused to the sea bed and undiscovered marine species is still unknown. Therefore, a complete threat analysis of the consequence of such deep ocean drilling and experiments must be carried ahead. Especially the ocean-dependent economies must step with caution as the environmental impact can cost the economy more than investment.

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About the author

Padmashree Anandhan is a Research Associate at the School of Conflict and Security Studies, National Institute of Advanced Studies, Bangalore. She is currently working on a commentary on the profile of Gazprom.

In brief

By Rashmi Ramesh

Greenland: Unusual heat and melting

The Greenland ice sheet saw a sharp spike in the rate and extent of melting between 15 and 17 July 2022. The unusual summer temperatures resulted in a melt of 6 billion tons of ice sheet per day, amounting to a total of 18 billion tons in a span of three days. Ted Scambos, a senior scientist at the University of Colorado's Earth Science and Observation Centre and National Snow and Ice Centre, said that the quantity of the water from the melt is enough to "cover West Virginia in a foot of water- 4 inches per day, roughly."

Scientists have reported that the maximum melt occurred in northern parts of Greenland. Warm air drifting from the Canadian archipelago and the high-pressure dome over Greenland have together been the primary reasons for the melt. While this could be a phenomenon resulting from localized weather conditions, Greenland in recent years has witnessed high temperatures, much above the normal levels. The temperature between 15-17 July was 60 degrees Fahrenheit, 10 degrees above normal for this time of the year, much before the annual peak melt in September.

Until 2000, the ice sheet accumulated nearly the same amount of ice that it shed. But, in the past two decades, the rate of accumulation has been remarkably low. Greenland's ice sheet may now have reached a point from which the melt is irreversible. It implies that the ice sheet will continue to contract even if the average temperature of the planet does not increase, which is far from reality.

Greenlandic ice sheet holds the second largest amount of ice, after Antarctica, therefore crucial for maintaining the sea level. In 2019, this was the single biggest

cause of the rise in the sea level, about 1.5 metres. If the sheet melts completely, the sea level would rise by seven metres, capable of subsuming island countries and major coastal cities. (Saleen Martin, "Greenland hit with unusually extensive melting of ice sheet, boosting sea levels, scientists say", *USA Today*, 23 July 2022; Rene Marsh, "The amount of Greenland ice that melted last weekend could cover West Virginia in a foot of water", *CNN*, 20 July 2022; Stephen Livingstone, "Trapped meltwater affects mass loss of Greenland ice sheet", *Nature*, 27 July 2022)

S&T Nuggets

By Joel Jacob

CLIMATE AND ENVIRONMENT

The US: USD 2.3 billion announced for addressing climate change

On 20 July, BBC reported President Joe Biden spoke in Massachusetts without formally declaring a climate emergency, and announced USD 2.3 billion to help build infrastructure to withstand extreme weather and natural disasters. The US President quoted by BBC said “Climate change is an existential threat to our nation and the world,” and “the health of our citizens and communities is at stake. So we have to act.” He further added: “Our children and grandchildren are counting on us, if we don’t keep climate change below 1.5 degrees Celsius we lose it all and we don’t get to turn it around.” He delivered the speech outside a former coal-fired power plant in the town of Somerset. The funds from an existing Federal Emergency Management Agency budget will be prioritised for disadvantaged communities to expand flood control, shoring up utilities, and help families pay for heating and cooling costs. (Bernd Debusmann Jr, “Biden unveils \$2.3bn plan to fight climate change,” *BBC*, 21 July 2022)

India: Development and religious tourism in the Himalayas

On 21 July, BBC reported about the surge in the number of worshippers over the past couple of decades due to the greater mobility, connectivity, and infrastructural development. The overload of tourists has an impact on the fragile ecological balance of the region vulnerable to earthquakes. In 2021, Prime Minister Narendra Modi said that more tourists would visit Uttarakhand over the next few years than in the past due to the improved connectivity. The development projects in the region like the widening of Char Dham road has been challenged by the environmentalists and locals on an ecological basis. (Sharanya

Hrishikesh, “Char Dham Yatra: Can India balance development and devotion in the Himalayas?” *BBC*, 21 July 2022)

Iran: Dying protest against the dying Urmia Lake led to arrests

On 17 July, BBC reported that people have been protesting against the near disappearance of Lake Urmia due to the parliamentary orders and abandonment of the lake which was once the world’s second-largest salt lake. Lake Urmia was Iran’s main domestic tourism spot before its shrinking in 1995 due to extreme drought, agriculture, and dam building. Within 20 years, the lake shrank to about 10 per cent and red algae blooms have been stopping tourists from visiting the lake. The authorities had started taking steps to restore the lake by focusing on the farmers in the region to plant less thirsty crops but did not find the desired results. (Ben Tobias, “Several arrests at a protest over dying Iranian lake,” *BBC*, 17 July 2022)

The UK: Impact of heatwave on Wildlife

On 16 July, BBC reported that the UK is sweltering in a heatwave with a rise in temperature expected in the coming weeks. The Wild Ken Hill, a nature site in Norfolk is one among the ecological sites which suffer the most. The heatwave highlighted the importance of beavers which were reintroduced at the site in 2020. The beavers have a water holding capacity of about three feet of water and are helping in holding the water. The animals were set up to return to nature. If not addressed, rising temperatures in the long term can have a major impact on flora and fauna. (“The Wild Ken Hill beavers helping protect wildlife in heatwave,” *BBC* 16 July 2022)

HEALTH

Africa: Ghana reports first outbreak of Marburg Disease



On 18 July, Ghana reported its first outbreak of Marburg virus disease after two people who were not related and had contracted the virus died on June 27 and 28. On 25 July, the wife and son of one of those patients also had Marburg virus disease. On 28 July, according to the Ghana Health Service, the child died. The Marburg virus is the pathogen that causes Marburg virus disease in humans. There are no vaccines or antiviral treatments for the disease but hydrating patients and treating their specific symptoms can improve their chances of survival. According to the WHO, the disease is clinically similar to Ebola in its spread, symptoms, and progression even though it is caused by a different virus. In Marburg's case, fruit bats are considered to be the hosts of the virus, though researchers say it does not cause them illness. ("Ghana declares first-ever outbreak of Marburg virus disease," *Express Healthcare*, 18 July 2022; April Rubin, "What to know about the Marburg Disease," *The New York Times*, 29 July 2022)

The US: First Polio case identified after a decade

On 25 July, the New York Times reported a case of polio in an unvaccinated adult man in Rockland County. The New York State Department of Health and its Rockland County counterpart confirmed that the infection was transmitted from someone who received the oral polio vaccine. The polio vaccine has not been administered in the United States since 2000. Officials said in a news release that the virus may have originated outside the US, where the oral vaccine is still administered. The current polio case presents a very low risk to those who are already vaccinated against polio, especially to those who have had all three shots and are close to 100 per cent protected. The last case of polio in the US was in 2013, a patient who brought the disease in from abroad. According to the Centers for Disease Control and

Prevention, there has not been a case originating in the United States since 1979. (Hurubie Meko, "First Polio Case in Nearly a Decade Is Detected in New York State," *The New York Times*, 25 July 2022)

The US: Complex combination of factors responsible for pediatric hepatitis

On 26 July, the New York Times reported that a new study shows how a complex combination of factors could be responsible for pediatric hepatitis cases. The studies are based on a few dozen cases and have not yet been peer-reviewed or published in scientific journals. A small subset of children with this particular gene variant, dual infections with A.A.V.2, and a helper virus, often an adenovirus, trigger an abnormal immune response that damages the liver. Pediatric hepatitis cases are exceedingly rare but can be severe. As of 8 July, according to WHO, 1,010 probable cases had been reported from 35 countries. Five per cent of those children have required liver transplants, and 2 per cent have died. The Scottish researchers also found that eight of the nine affected children, or 89 per cent, shared a relatively uncommon variant of a gene that codes for a critical protein in the body's immune response. This particular variant is present in just 16 per cent of Scottish blood donors. (Emily Anthes, "Viral Infections and Gene Variant Are Linked to Child Hepatitis Cases," *The New York Times*, 26 July 2022)

SPACE

The US: First image from the James Webb Space telescope released by NASA

On 11 July, the images from the James Webb telescope (JWST) were released at a White House event attended by President Joe Biden and Vice President Kamala Harris. The deep field of distant galaxies dating back to the first billion years after the Big Bang is the first full-color image to come from the James Webb Space



Telescope. It shows a cluster called SMACS 0723 about 4.5 billion light years away. The NASA Administrator Bill Nelson quoted by Space News said “We’re looking back more than 13 billion years,” President Joe Biden appeared pleased by what he saw and by the performance of JWST that the space telescope after billions of dollars of cost overruns and years of scheduled delays and had symbolized the spirit of American ingenuity and shows the extend of achieving what humans could discover. (Jeff Foust, “NASA releases first color image from James Webb Space Telescope,” *Space News*, 11 July 2022)

TECHNOLOGY

Technology: Period tracking apps and privacy

On 26 July, Innovation&Tech today reported the period tracker apps are working hard to implement new software

that would make users anonymous after the overturning of Roe v. Wade. Apps like Flo, Clue, and Apple’s Health app contain personal information that could be taken in abortion cases in states where the procedure is outlawed. Natural Cycles, a period and fertility tracking app works to make users anonymous even to the company itself as the app and phone data are shared and sold without prominent disclosure often for advertising purposes. (“Period-Tracker Apps Aim for Anonymity Following Roe v. Wade Decision,” *The Wall Street Journal*, 26 July 2022)

About the authors

Harini Madhusudan and Akriti Sharma are doctoral scholars at NIAS. Joel Jacob is a research assistant at NIAS.



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COVER STORY

Ukraine: The Recurring Russian Cyberattacks

The cyberattacks on Ukraine are not a new phenomenon; however, the large scale Ukrainian and global retaliation are. The Russian cyberattacks on Ukraine before the invasion have brought its hybrid warfare strategy to the limelight. The problem of attribution and governance in cyberspace has yet again surfaced, and the international community does not seem to have an answer.

By Jehil Samuel J



Photo Source: Britannica



22 March 2022, Vol. 1, No. 18

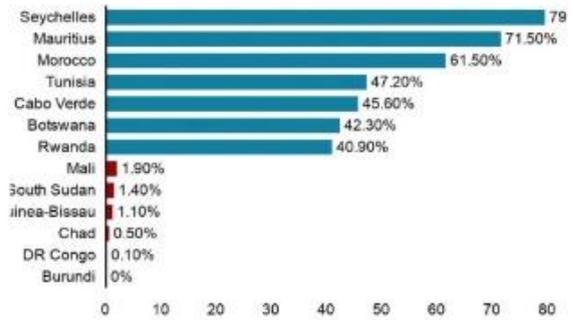
COVER STORY

Politics and economics of vaccines in Africa

Africa has been facing a dearth of vaccines both in terms of accessibility and availability. Vaccine disparity prevails both within Africa and globally. Efforts have been made to ensure that the African Union (AU) is as much a partner in vaccine technology as the European Union (EU). However, vaccination politics exceed general understandings of equity.

By Jocina Cera Matthews

Most and least vaccinated countries in Africa
 1are of total population who received a full dose schedule



Source: World Health Organization (WHO), data as of 30 December

Photo Source: World Health Organization



13 May 2022, Vol. 1, No. 21

COVER STORY

China in Space: Shenzhou-13 and Tiangong

The Chinese space station would be less bulky in comparison to the International Space Station (ISS). However, China is yet to garner support from the other space powers in this regard. Although nine countries have signed up to work with the space station, the initiative has the potential to rope in many space programs to collaborate or cooperate on the Tiangong space station.

By Harini Madhanadas



Photo Source: Shenzhou



05 April 2022, Vol. 1, No. 19

COVER STORY

Russia-Ukraine war: Disruption in the supply chains

Russia's invasion of Ukraine hit the global supply chains that were recovering post-COVID-19 pandemic. The war has affected industries and commodities ranging from wheat, semiconductors, and even fertilizers. The ongoing war has furthered the possibility of a shift from global to regional sourcing of goods and commodities to strengthen supply chains and deter the possibility of disruptions. The war has also renewed the push for countries, MNCs, and other businesses to become self-reliant or integrate themselves closer to the resource and the consumer market.

By Arwin Immanuel Dhanabalan



Photo Source: Bloomberg/Maria Tereza/Getty Images

