

Tuesday, 23 February 2021

UN Science-Policy-Business Forum on the Environment 2021 18-20 February 2021

“The time for action is now.” These words were spoken by Inger Andersen, UN Environment Programme (UNEP) Executive Director, at the closing session of the Third Global Session of the UN Science-Policy-Business Forum on the Environment (UN-SPBF) 2021. They echoed the sense of urgency shared by the participants in addressing the three planetary crises identified in the UNEP’s Medium-Term Strategy – climate change, biodiversity loss, and pollution.

The UN-SPBF 2021 convened under the theme, “Integrated Solutions #ForNature.” It aimed to identify how to address the three planetary crises through a shift to sustainable consumption and production (SCP) patterns. The Forum was organized along three thematic tracks:

- Big Data and Frontier Tech: Powering the Transition to a Sustainable Future;
- Build Better: Integrated Solutions for Low-carbon, Resource-efficient, Inclusive Societies; and
- Managing Risk: Pollution Prevention and Management.

The thematic track, “**Big Data and Frontier Tech: Powering the Transition to a Sustainable Future**,” focused on how artificial intelligence (AI) is transforming industry towards a sustainable pathway, whether there is sufficient data for essential decision making to reach the Sustainable Development Goals (SDGs), and enablers of an ethical, equitable digital future, among other issues. The session launched the UNEP Marine Litter Digital Hub, and highlighted examples of “landmark initiatives to save the planet,” including Google Earth, the Microsoft Planetary Computer, and the Earth Observation Biodiversity Network (GEOBON).

The thematic track, “**Build Better: Integrated Solutions for Low-carbon, Resource-efficient, Inclusive Societies**,” featured two sessions: 1) Rethinking Cities: Bringing Nature to the Urban Environment; and 2) Nature-Positive Food Systems for a Healthy Planet and Healthy People.

The session on cities highlighted transitioning towards low-carbon, resource efficient, and socially just cities as key to achieving the 2030 Agenda for Sustainable Development. Participants agreed that cities are at the forefront of both environmental and health crises and solutions, and while

commitments have been made and “action is on its way,” scale and pace are needed.

The session on nature-positive food systems discussed food systems’ role in SCP. Many stressed a just, sustainable society cannot be achieved without first addressing the food system, and acknowledged that multi-stakeholder collaboration on food waste, nutrient efficiency, and digitizing farming communities is key to achieving nature-positive food systems.

The thematic track, “**Managing Risk: Pollution Prevention and Management**,” featured sessions on “Marine Litter and Microplastics Mitigation and Prevention” and “Addressing E-waste through Tracking, Traceability and Circular Approach.”

Discussions on marine litter and microplastics highlighted the role of partnerships in promoting initiatives to address plastic pollution in oceans, seas, and rivers and to incentivize recycling. At the same time, participants recognized the need for better coordination and monitoring and evaluation.

The session on e-waste underscored that the COVID-19 pandemic had revealed society’s reliance on electronic products. This, participants said, brings to the fore the importance of

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using a circular economy approach to address the sustainable management of e-waste. They noted the lack of sufficient data to fully understand the problem, and recognized that part of the solution will be to change consumer habits and expectations.

The closing session, “*Making Peace with Nature: The Defining Task of the 21st Century*,” reflected on the discussions that had taken place over the course of the three days. Dignitaries urged seizing the opportunity presented by the pandemic to help shift the planet on to a more sustainable trajectory. They emphasized technology, partnerships, and multilateralism as the key levers to make this possible.

The Youth and Children UN-SPBF Working Group was launched during a pre-session on green jobs and green initiatives.

The UN-SPBF 2021 was held online from 18-20 December 2021, in advance of the Online Session of the fifth session of the UN Environment Assembly (UNEA-5). Its outcomes will serve to inform discussions at UNEA-5.

Brief History

Launched at UNEA-3 in December 2017, the UN Science-Policy-Business Forum on the Environment is a framework designed to catalyze a more dynamic interface between science, policy, business, and society. The Forum aims to facilitate multi-stakeholder platforms to identify and promote opportunities for green investment that are driven by advances in science and technology, empowering policies, and innovative financing. It also seeks to function as an accelerator and incubator of innovation and positive change to achieve the SDGs.

The Forum brings together more than 2,000 organizations around the world to:

- facilitate issue-based consultations and building of communities of practice around key themes, bringing together top scientists, policy makers, citizen science groups, and the business sector;
- showcase positive impacts of transformative green solutions and technologies, and take stock of the policies and investments required to scale up successful models; and
- contribute to UNEA, the UN High-level Political Forum on Sustainable Development, and other global forums to enhance decision making and inform future visions on the environment.

UN Science-Policy-Business Forum on the Environment

(2017): The inaugural UN-SPBF took place in December 2017. It launched the report, “Frontiers 2017: Emerging Issues of Environmental Concern,” which addressed six key emerging issues: the environmental dimension of antimicrobial resistance; nanomaterials; Marine Protected Areas and sustainable development; sand and dust storms; off-grid solar solutions; and environmental displacement.

UN Science-Policy-Business Forum on the Environment

(2019): The Second Global Session of the UN-SPBF (UN-SPBF-2) convened in March 2019. In support of the UNEA-4 theme of “Innovative Solutions for Environmental Challenges



Inger Andersen, Executive Director, UNEP

and Sustainable Consumption and Production,” UN-SPBF-2 focused on six streams: science shaping green policies and market responses; big data: towards a digital platform for our planet; smarter, greener solutions for cities; green technology startup initiative; climate challenge: finance, markets, and non-state actors; and sustainable food for a healthy planet. Priorities for action identified included: the need for more ambition on energy efficiency and climate change mitigation; establishing new business models to drive the circular economy; and focusing on resource efficiency to decouple economic growth from biodiversity and ecosystem services loss.

UN-SPBF 2021 Report

Opening and Big Data and Frontier Tech: Powering the Transition to a Sustainable Future

This session took place on Thursday, 18 February, and was convened with the Group on Earth Observations (GEO) and Technology Partners. Moderated by Axel Threlfall, Reuters, the session discussed:

- How artificial intelligence is transforming industry towards a sustainable path;
- How to manage AI’s environmental footprint;
- Whether there is sufficient data for essential decision making to reach the SDGs;
- Landmark initiatives for the planet such as GEOBON, Google Earth Engine, and the AWS-GEO Cloud Credits Programme; and
- Equity, ethics, transparency, diversity, and inclusion as enablers for a fair digital future.

During the *opening segment*, Inger Andersen, Executive Director, UNEP, announced the launch of the UNEP report, “Making Peace with Nature,” funded by the EU and Norway, which presents both the triple crises of climate change, biodiversity loss, and pollution and sets out what we need to do. She underscored the need to accelerate digitization of science to make it more democratic, understandable, and accessible.

Hans Brattskar, Special Envoy, Ministry of Climate and Environment, Norway, on behalf of the UNEA-5 Presidency, said

the Online Session of UNEA-5 needs to be action-oriented, focus on finding solutions for current global challenges, see the bigger picture, and foster collaboration. He highlighted the role of the UN-SPBF in finding the solutions needed for taking action.

Munir Akram, President, UN Economic and Social Council (ECOSOC), noted the need for building a database of all open-source technologies in the world that could be used to build SCP for developing countries. He said identifying the right research and development (R&D) objectives is necessary to achieve the SDGs.

Petteri Taalas, Secretary-General, World Meteorological Organization, emphasized the need to improve the quality of early-warning systems to enable the early prediction of natural disasters, which hit poor countries disproportionately.

In ensuing discussion, AI-generated “digital humans” Sam and Bella, from the UNEP Marine Litter Digital Hub, posed questions to panelists. Andersen highlighted the need for improving data management and analysis, noting we have “oceans of data but only drops of information.” Brattskar underscored the importance of political will to leave no one behind.

The session on “**Big Data and Frontier Tech: Powering the Transition to a Sustainable Future**” included eight segments:

- Setting the Scene;
- AI, Technology and the Road to Net Zero;
- Big Data, Big Deal?
- Earth Observation: Evidence for Decision Making;
- Frontier Tech: The Future is Now... What have we Learnt?
- UNEP Marine Litter Digital Hub Launch;
- Enablers of an Ethical, Equitable Digital Future; and
- Social and Economic Values of a New Digital Age.

Setting the Scene: Laurent Durieux, Research Institute for Development, France, said defining a new path toward co-habitability between social and ecological systems will require lots of open data transformed to be better understood and utilized. He discussed Data Terra, which seeks to bring together diverse types of data to comprehensively understand and predict the functioning and evolution of Earth systems.

Juliet Kabera, Director General, Environment and Climate Change, Rwanda Environment Management Authority, discussed how Rwanda is using digital transformation to achieve the SDGs, including using drones for georeferenced mapping of wetlands, using digital maps to improve and accelerate land title registration, and providing real-time air quality indices.

David Jensen, Digital Transformation Taskforce Coordinator, UNEP, highlighted four challenges that can be addressed through digital transformation to drive “whole-of-society” solutions:

- help consumers select sustainable products and adopt sustainable lifestyles;
- help producers measure and disclose the environment and climate performance of their products and supply chains;
- help investors assess climate and environmental risk as financial risk; and

- help regulators monitor real-time progress and risks at national and planetary levels.

AI, Technology and the Road to Net Zero: Kathryn Guarini, Chief Operating Office and Vice President, Impact Science, IBM Research, provided an overview of AI’s evolution and its role in transforming industry. She highlighted the core challenges facing today’s AI: an “insatiable” need for data; limited ability for generalization; lack of trust in AI; its unbounded computational demands; a big environmental footprint; and inadequate governance over the technology.

Alessandro Curioni, Vice President Europe and Africa, IBM Research, discussed how AI can accelerate discovery of new materials, like it is already doing for photoacid generators used in microchip development.

Florence Verzellen, Executive Vice President in charge of Industry, Marketing and Sustainability, Dassault Systemes, highlighted a project with Accenture to prove digital technology can contribute to a resource economy and help reset the economy by accelerating the “sustainable destruction” of goods.

Yousif Al Ghamdi, Head of Energy Sector, Saudi Authority for Data and Artificial Intelligence, said decarbonization of energy has only been made possible by the emergence of digital technology, facilitating an exponential drop in costs across production, storage, and distribution. He said AI will be a key building block of the technological foundation required for SCP.

Adam Smith, Co-Founder and Head of Strategy, Descartes Labs, said big data and remote sensing can help companies be profitable while pursuing sustainability goals. He noted companies can monitor their supply chain in real time, make adjustments if necessary, and build brands around sustainability.

Jonathan Everhart, Chairman and CEO, Global ReEnergy Holdings, and Ray Amani, Assistant Vice President of Investment and Head of Index Product Management, Nasdaq, presented on the special-purpose acquisition company process whereby a company is formed strictly to raise capital through an initial public offering for pursuing deals in a particular industry or sector, which they described as a “largely manual” and carbon-intensive process. They said digitizing it can improve the overall



Munir Akram, President, ECOSOC



Thuraya al Hashimi, United Arab Emirates Federal Competitiveness and Statistics Centre

efficiency of capital markets, thereby contributing to achieving the SDGs.

Tamar Eilam, IBM Fellow, IBM Research, stressed the need to move from AI accuracy to AI efficiency. She noted energy is the main cost of AI, and reducing the energy consumed to develop AI would also contribute to reducing costs.

In ensuing discussion, participants highlighted the need for working with communities when it comes to data privacy and for the SCP of technology, which implies reuse and recycling.

Big Data, Big Deal? David Jensen, Digital Transformation Taskforce Coordinator, UNEP, moderated the segment.

Jesarela López, Director of Technical Coordination of Vice Presidency, National Institute of Statistics and Geography of Mexico, presented the Geospatial Data Cube of Mexico, software for managing and analyzing geospatial data to feed into environmental decisions and help evaluate the environmental impact of public policy.

Dilek Fraisl, Research Scholar, International Institute for Applied Systems Analysis, said citizen science can contribute to assessing 35% of the SDG indicators, including environmental indicators, and to catalyzing action towards the SDGs through the social learning it enables.

In ensuing discussion, participants noted 29 of the SDG indicators can be monitored through earth observations, and discussed ways of making biodiversity data more accessible and available so it can influence private-sector decision making.

Meelis Münt, Secretary General, Ministry of the Environment, Estonia, noted his government's commitment to realizing the decision by UNEA-4 to develop a Global Environmental Data Strategy by 2025 through spearheading the creation of the Data for the Environment Alliance (DEAL), which will bring together governments, the private sector, academia, and civil society to help UNEP build the Strategy.

Alexandre Caldas, Chief, Big Data Branch, UNEP, reviewed progress towards developing the Strategy, efforts to identify and bridge key data gaps, and work to build a "situation room," a constantly evolving data platform with three priorities: integration (of datasets); impact (helping decision makers take action); and partnerships.

Earth Observation: Evidence for Decision Making: Steven Ramage, Head of External Relations, GEO Secretariat, moderated the segment.

Pascal Peduzzi, Director, Global Resource Information Database, UNEP, demonstrated what the UNEP data platform currently looks like. He explained its operating rationale is to make it easy for people to find the environmental information they are seeking, which will be updated "on the fly."

Huadong Guo, Director, Institute of Remote Sensing and Digital Earth, China, outlined his country's efforts to harness Big Earth Data to create new sources of data for SDG evaluation, providing more ways to monitor progress on the SDGs, and create new evaluation methodologies. He recalled Chinese President Xi Jinping's 2020 announcement that China will set up an International Research Center of Big Data for the SDGs.

Thuraya al Hashimi, Executive Director, Digital Data Enabling Sector, Federal Competitiveness & Statistics Centre (FCSC), United Arab Emirates, briefed participants on the creation of the Digital Data Enabling Sector at FCSC and the tools based on earth observation data that it has created to aid the Centre, such as georeferenced agricultural surveys conducted using drones.

Laurence Monnoyer Smith, Environment and Climate Advisor, Space Climate Observatory (SCO), introduced SCO, an informal group of space agencies and international organizations created to step up coordination in developing customized operational tools to aid local decision makers with addressing climate change.

Frontier Tech: The Future is Now...What have we Learnt? Discussing landmark initiatives for the planet, Charlotte Bishop, Senior Project Manager, Kongsberg Satellite Services, said higher resolution satellite datasets will improve reporting and provide baseline data for evaluating and monitoring the status of our ecosystems.

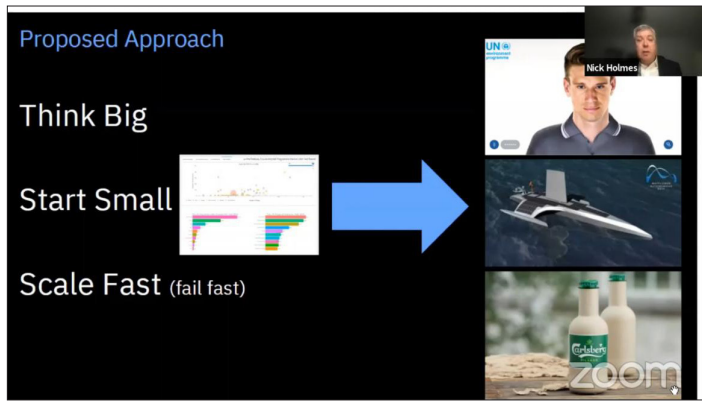
Bonnie Lei, Head of AI Global Strategic Partnerships, Microsoft, presented the Microsoft Planetary Computer, which aims to provide access to the largest environmental datasets to protect and restore our ecosystems. Responding to a question on youth participation, Lei mentioned Microsoft's collaboration with youth for the AI for Earth programme.

Maria Cecilia Londoño Murcia, Senior Researcher, Alexander von Humboldt Biological Resources Research Institute, Colombia, presented GEOBON, a network of partnerships working on integrating biodiversity monitoring across sites on land and sea.

Rebecca Moore, Director, Google Earth, presented the Google Earth Engine, which combines a multi-petabyte catalog of satellite imagery and geospatial datasets with planetary-scale analysis capabilities.

Ana Pinheiro Privette, Lead, Amazon Sustainability Data Initiative (ASDI)-AWS-GEO Cloud Credits Programme, presented ASDI, which seeks to accelerate sustainability research and innovation by minimizing the cost and time required to acquire and analyze large sustainability datasets.

Rafael Monge Vargas, Director, National Geoenvironmental Information Center, Costa Rica, presented the GEO-Amazon



Nicholas Holmes, IBM, presenting on Data and AI

Earth Observation Cloud Credits Programme, which includes a modeling system for natural capital accounting in Costa Rica.

UNEP Marine Litter Digital Hub Launch: Axel Threlfall, Reuters, moderated the segment.

Heidi Savelli-Soderberg, Programme Officer, UNEP, introduced the Hub, explaining it is a collaboration between the UN-SPBF, IBM, and the Global Partnership on Marine Litter (GPML). The collaboration showcases the latest AI-driven data integration tools, digital humans built on machine learning models, and a digital collaboration center.

Nicholas Holmes, Chief Technology Officer for Global Government, IBM Cloud and Cognitive Software, said the project had three areas of focus: how best to use technology to inform decision making; how to engage with digital humans; and how to promote collaboration for rapid change. He said the project looked at how to shorten the collection and organization phase of building data on marine litter by as much as 90%, find high-confidence ways to bridge data gaps, and improve analysis to create a baseline for marine litter density.

Participants viewed a demonstration of the AI-generated digital humans, Sam and Bella, answering questions about the use of IBM's Watson AI to build the UNEP Marine Litter Digital Hub.

Willem Clappaert, Government Industry Solutions Leader, IBM, discussed how the Hub will serve as a global digital community platform to exchange ideas virtually and in real time. He announced the first virtual session will be held shortly on marine litter and microplastics, and urged people to participate and be ambitious and creative.

Enablers of an Ethical, Equitable Digital Future: Diana Mastracci Sánchez, Founder, GEO Indigenous Alliance, underscored the importance of earth observation technology to indigenous peoples, "the guardians of biodiversity," among those most affected by climate change. She reviewed some of the recommendations of the December 2020 GEO Indigenous Summit, including co-design of GEO tools in partnership with indigenous communities.

Kate Fickas, Founder, Ladies of Landsat, said her group started because she saw a large gender gap in earth observation science, with most earth observation journals having few women on their editorial boards, women's research less likely to be

cited, and women "generally ignored" as end-users. She urged involving women early in all earth observation data projects.

Social and Economic Values of a New Digital Age: Threlfall moderated the segment.

Dragoş Tudorache, Chair, Special Committee on Artificial Intelligence in a Digital Age, European Parliament, explained that the two current policy foci for the EU are its Digital Agenda and the European Green Deal, which inevitably intersect. He said discussions so far only addresses how digital tools help solve environmental problems, and not the potential environmental impacts and costs of using such tools. Tudorache expressed concern the EU might get too "wrapped up" in being a standard bearer, and suggested it instead consider how to advocate for a multilateral environment data framework that benefits everyone.

Ado Lohmus, Permanent Representative to UNEP, Estonia, said Estonia is reaching out to all member States to join DEAL before it is formally launched at the end of March. He invited the private sector and civil society to get onboard and work to incentivize data management improvement, building data infrastructure, and promoting harmony in environmental data to create a "powerful, tangible" platform.

Steven Ramage, GEO, on behalf of the Gilberto Camara, Director, GEO Secretariat, closed the session, highlighting among key takeaways that while there is a surfeit of enthusiasm for using digital technology to scale up environmental action, more effort is needed on the policy side to harness these tools.

Build Better: Integrated Solutions for Low-carbon, Resource-efficient, Inclusive Societies

Rethinking Cities: Bringing Nature to the Urban

Environment: This session was held on Friday, 19 February, with the Sustainable Cities Impact Programme, the Integrated Urban Solutions Partnership, and the Global Alliance for Building and Construction (Global ABC). Axel Threlfall, Reuters, moderated the session, which examined:

- Strategies needed to redesign, rethink, and transform cities;
- Infrastructure needed for efficiency, resilience, and inclusion;
- Policies, investments, and multi-sector initiatives required to implement these strategies at scale; and
- Cross-cutting interlinkages in different infrastructure systems, with a view to supporting changes in consumption and production patterns.
- Martina Otto, Head of Cities, UNEP, said COVID-19 has:
- demonstrated cities are at the forefront of both impacts and response;
- shown us how much harder we are hit if we are unprepared, revealing the need to build back better;
- reminded us of the importance of access to nature in cities; and
- highlighted the fragility of complex value chains.

Julie Greenwalt, Co-Chair, GEO for Cities, UNEP, observed that cities are at the forefront of climate, biodiversity, and human health crises. She said GEO Cities looks at three dimensions of potential urban transformation: circularity and decarbonization; resilience and sustainability; and inclusivity and justice. She



Yvonne Aki-Sawyer, Mayor of Freetown, Sierra Leone

identified the effectiveness of multi-level, multi-sectoral action among the current trends.

Kobie Brand, ICLEI Vice President for Africa and Director, ICLEI Cities Biodiversity Center, said while over 10,000 cities have committed to undertake a green transition, most cannot finance it. She urged more direct access to national and international funding, “a seat at the table” in UN processes, more city linkages to global agendas, and greater exchange of ideas among cities. Brand emphasized local governments are united in their commitment to integrating biodiversity in local SDGs implementation.

Yvonne Aki-Sawyer, Mayor of Freetown, Sierra Leone, underscored the need to not only plant but to grow trees to ensure citizens’ ownership of bringing back nature in cities. She presented a tree-tracker app that shows trees’ progress across their lifespan.

Carlos Cadena Gaitán, Secretary of Mobility, City of Medellín, Colombia, said Medellín is transforming a local airport into a forest. He underlined the importance of localizing global environmental agendas, with a low carbon-high biodiversity focus.

Li Zhang, Secretary General, Society of Entrepreneurs for Ecology Foundation, China, underscored the need to rely on science to understand the biodiversity living in cities, as well as on the civil society to spread awareness about it.

Aniruddha Dasgupta, Global Director, World Resources Institute Ross Center for Sustainable Cities, highlighted the importance of integration across sectors, jurisdictions, and outcomes for ensuring the efficient use and management of resources for growing urban populations. Explaining that the best solutions are local, he cautioned against “rubber-stamping” solutions, and recommended identifying patterns transferable between cities instead.

Anu Ramaswami, Co-author, International Resources Panel report, “The Weight of Cities,” said cities have a great potential to exchange resources among citizens and sectors, and urged developing a “cross-sector symbiosis” that uses a circular economy approach. She cited circular economy as key to ensure resource exchange, and called for encouraging and preserving sustainable lifestyles.

Carlos Manuel Rodríguez, CEO and Chairperson, Global Environment Facility (GEF), urged using integrated approaches to urban planning, and underscored integrated urban planning should consider nature as an additional sector.

Emmanuelle Nasse Bridier, Head of Urban Resilience Initiative, Meridiam, said it is necessary to find ways to align the goals of the private sector with those of the public sector to understand what is doable, which can then help develop a pipeline of private sector projects that contribute to the sustainability of cities.

Martin Powell, Head of Urban Development, Siemens AG, emphasized five emerging urban trends:

- The shift to electric vehicles, which implies risks to urban space use;
- The transformation of buildings into distributed power sources;
- An uptake in polluter-pays mechanisms, such as congestion charges;
- Bundled solutions, such as rooftop solar panels along with energy efficiency measures and green walls; and
- Connection of infrastructure to a common data platform.

Anton Koller, President, District Energy, Danfoss, noted that while most buildings use district energy, most remain fossil fuel-based. He explained the advantage of district energy is it can provide resilient systems where technology can be switched readily. He urged focus on energy efficiency first and decarbonization second since the former often cuts energy needs significantly.

Harry Verhaar, Head of Global Public and Government Affairs, Signify, said up to 50% of urban energy consumption involves lighting, and energy efficiency investments can save up to 80% of its cost, which can then be invested in other areas. He said switching a single streetlight to solar can save enough power to charge a car for a year. Verhaar urged greater focus on circular procurement models.

Ursula Hartenberger, Global ABC, said while data management is crucial to decarbonizing the building sector, building data is often not comprehensive across the lifecycle, transparent, up-to-date, or comparable. She described Global ABC’s efforts to develop a single, comparable “building passport” covering the whole building lifecycle from planning to decommissioning.

Paolo Falcioni, Director General, Home Appliance Europe, underscored there is sufficient technology to lead a sustainable lifestyle. It is more efficient to use dishwashers than doing dishes by hand, he said.

Lan Wang, Deputy Dean, College of Architecture and Urban Planning, Tongji University, discussed urban planning that allows people to reach green walking spaces within 15 minutes, and focuses on both urbanized and non-urbanized areas, such as forests or waterfronts, integrating natural and urban resources.

Sarah O’Carroll, Cities Lead, The Ellen MacArthur Foundation, underscored the need to change the current “take resources-make waste” economy and reimagine cities in line

with a circular economy. She called for investment in innovation, infrastructure, and skills.

Maimunah Mohd Sharif, Executive Director, UN-Habitat, underscored the need for “public-private-people partnerships” for advancing sustainable and green urbanization. She emphasized bringing nature back to cities will be essential for climate change adaptation and mitigation.

Rodrigo Rodríguez Tornquist, Secretary of Climate Change, Sustainable Development and Innovation, Argentina, highlighted the need to promote urban agriculture for better and organic food in cities.

Robert Pinter, Green and Healthy Buildings Manager, Europe, International Copper Association, noted that to achieve real circularity, the construction sector should use only recyclable materials.

Kerryn Muleya, UNEP Major Group for Children and Youth (MGCY), said it is important the developing world is well prepared in “this reskilling emergency,” and women and youth are central to developing policies to achieve the change we need.

Abdalah Mokssit, Secretary, Intergovernmental Panel on Climate Change (IPCC), described cities as laboratories for testing three concepts: knowledge for risk management; multi-level vigilance; and migration to a science-policy-business model. He said during the IPCC’s sixth assessment report cycle, the Panel will offer solutions, with many chapters dealing with cities, and invited all to contribute to the review process.

Santiago Saura Martínez de Toda, Councilor for International Affairs, City of Madrid, Spain, discussed Madrid’s plans to reduce greenhouse gas emissions by 60% by 2030. He said cost-benefit analysis suggests a 30% return on investments in climate action, but costs are upfront, and the return on investments only turns positive during the 2030-2040 period. He detailed plans to create a metropolitan forest ringing Madrid.

Oliver Hillel, Programme Officer, Convention on Biological Diversity (CBD) Secretariat, on behalf of the CBD Secretariat Executive Secretary, stressed the need to: change the texture of cities to include nature; stress urban-rural linkages; unleash the power of cities to deliver green jobs; and take advantage of the programs that already exist.

Martina Otto summarized key takeaways from the session, including:

- It is clear cities are at the frontline of both the impact of and response to crises, and they should have a seat at the table;
- COVID-19 recovery must have “green strings attached”;
- Sharing experiences and encouraging city experimentation help inspire others to act;
- The time to rethink cities is now;
- Commitments have been made, and action is on the way, but scale and pace are needed;
- While cities are at the forefront of action, they cannot do it alone; and
- An “all-citizen” and “all-government” approach is needed.

Nature-positive Food Systems for a Healthy Planet and

Healthy People: This session took place on Saturday, 20 February. It convened in support of the 2021 Food Systems Summit and the UN Decade on Ecosystem Restoration. Pratima Singh, The Economist Intelligence Unit, moderated the session, which addressed:

- Food system transformation as integral for nature and economies;
- Regenerative agriculture connecting us back to nature;
- Promoting nutrient use efficiency;
- Tackling food waste; and
- Targeted actions by public and private actors supporting the required transformation.

The session included segments on:

- Road to the UN Food System Summit;
- Focus on Pollution Prevention and Management: Nutrient Use Efficiency;
- Sustainable Consumption and Urban Food Systems: Setting the Scene;
- Food Waste;
- Urban Farming; and
- Digital Farming.

Road to the UN Food System Summit: James Lomax, Coordinator, Food Systems Summit and Sustainable Food Systems and Agriculture Advisor, UNEP, noted the food system is responsible for endangering 85% of species at risk. He characterized COVID-19 as a “wake-up call” about zoonotic diseases, the impact of diet on health, and the fragility of value chains. He said the Summit will be an opportunity to “turn the corner” towards action and systemic change to create a better food system.

Philip Lymbery, CEO, Compassion in World Farming, said industrialized farming is a major driver for deforestation, soil degradation, and animal cruelty, as well as “a breeding ground for future pandemics.” He urged reconnecting farming with nature through everyone doing their part: individuals changing dietary habits, governments redirecting subsidies and incentives, and finance only supporting agriculture with nature-positive practices.

Noting growing freshwater scarcity worldwide, Tarifa Al Zaabi, Acting Director-General, International Center for Biosaline Agriculture, said her organization is seeking to identify which crops can be sustainably grown in saline water or brine, and is working with farmers to raise awareness about these crops and how they can diversify.



Rodrigo Rodríguez Tornquist, Secretary of Climate Change, Sustainable Development and Innovation, Argentina



María Carolina Durán, Secretary of Economic Development, City of Bogotá, Colombia

Alzbeta Klein, Director General, International Fertilizer Association, said three things are needed to ensure a more nature-positive agriculture: governments providing incentives for the outcomes desired; industries involved in the sector putting sustainability at the core of their value chains; and finance providing more green loans that incentivize sustainable agriculture practices.

Focus on Pollution Prevention and Management: Nutrient Use Efficiency: Mahindananda Aluthgamage, Minister of Agriculture, Sri Lanka, noted the UNEA-4 resolution on sustainable nitrogen management recognizes the multiple pollution threats resulting from anthropogenic reactive nitrogen, including air pollution, with adverse effects on the terrestrial, freshwater, and marine environments.

Mark Sutton, Environmental Physicist, UK Centre for Ecology & Hydrology, announced that the report, “Appetite for Change,” linking food choices to nitrogen, will be launched ahead of the UN Food Systems Summit in 2021. He said nitrogen must be included in the climate discussions, which should focus on carbon and nitrogen. Sutton noted the UN climate and biodiversity conventions will work together on nitrogen management.

Maliha Malik, Chief Operating Officer, Food Security and Agriculture Center of Excellence (FACE), Fauji Fertilizer Company, explained that to ensure food security and improve the capacity of Pakistani farmers, FACE developed a holistic programme encompassing economic, agricultural, and socio-welfare uplift work, including educating farmers on fertilizers and land use.

Sustainable Consumption and Urban Food Systems:

Setting the Scene: Martina Otto, Head of Cities, UNEP, said food waste should be tackled from a systems perspective, “from farm to fork,” considering all aspects, including climate change. Recalling the SDG 12.3 target of halving per capita global food waste by 2030, and observing that measurement is critical for targeted action, she noted the forthcoming release in March of the UNEP Food Waste Index.

Renato Alvarado, Minister of Agriculture and Livestock, Costa Rica, via video message, stressed three factors in making food systems more sustainable: R&D to generate ideas about how to

produce more with less, promote healthy diets, and reduce food waste; cooperation and alliances that prioritize common benefits; and the development of local food economies that strengthen the socioeconomic system.

Noting that food systems contribute 30% of global CO₂ emissions, of which 50% are from animal product consumption, and that 20% of the global water supply is used to produce animal-based food, Shirley Lu, GEO Author and Managing Director Asia, ProVeg International, said ProVeg aims to reduce the global consumption of animal products by 50% by 2040 by providing plant-based and cell-based protein alternatives.

Food Waste: Noting estimates that we throw away one-third of the food we produce, Marcus Gover, CEO, WRAP, said most people do not realize the size of the problem, which is why the forthcoming Food Waste Index is so important. He called on governments and international organizations to prioritize funding to track food waste, especially at home, and help citizens understand how they can reduce waste.

Christina Bauer-Plank, Global Brand Vice President, Hellmann’s, Unilever, said her company has committed to halving its food waste by 2025, engaging supply chain partners to do likewise, and urged the rest of the food industry to adopt similar targets and measures. She said Unilever is investing in research on the triggers for household food waste and how to influence change.

María Carolina Durán, Secretary of Economic Development, City of Bogotá, Colombia, via video message, said Bogotá wastes around 30% of its food. She said the city has developed a clear roadmap of action to address food waste, and announced a partnership with UNEP to develop a behavior tracking system to reduce food waste, the analysis from which will strengthen knowledge, improve policies, and raise consumer awareness.

Urban Farming: Wilson Merino, Director of the Economic Promotion Agency Conquito, City of Quito, Ecuador, highlighted the need to develop green and blue infrastructures to promote environmental sustainability. He outlined ways in which urban farming can provide opportunities for integrating immigrants in the economy.

Esau Galukande, Director of Gender and Community Service, City of Kampala, Uganda, said 1,000 households are currently involved in urban farming in Kampala, including fisheries. He described two urban centers where farmers get training on urban farming, which enables them to contribute to knowledge dissemination among the community.

Ullas Samrat, Co-Founder, Triton Foodworks, highlighted investment in R&D as “the key to solving tomorrow’s challenges today.”

Digital Farming: Jean-Marie Dembele, Gaston Berger University, Senegal, described how AI was used to design and optimize a planted filtration system to filter wastewater for use in fertigation on farms and homesteads, and the use of sensors to monitor its application and use. He asked for input from farmers

on what they need to support such practices and policymakers to support relevant research.

Emphasizing that most farmers consider the weather to be the most important factor for their success, Peter Rylander, Partner, IBM Global Business Services, discussed the free Farmweather app his company designed with smallholders in mind, which enables “every farmer on the planet” to localize detailed, accurate, and frequently updated weather forecasts to their farm.

Pål Øystein Stormorken, Vice President, Farm Ecosystems and Partnerships, Yara International, presented Action Africa, his company’s initiative which has provided fertilizer donations to East African farmers, increased supply chain transparency through a fertilizer tracking system from Yara to consuming farmers, and developed a free digital platform that provides some millions of farmers with agronomic knowledge. He said Yara is also working with telecom companies to improve connectivity for farmers.

Berkehan Eric, UNEP MGCY, underscored the need for increasing youth participation in the design of food systems.

Francine Pradez, UNEP MGCY, called for nature-positive food systems that prioritize nutrition, and the application of a gender lens to food systems.

Key takeaways from the session included:

- There has been an openness and creativity to find effective solutions for nature-positive food systems; and
- There is an urgent need for multi-stakeholder collaboration to address the current lack of sustainability of our food systems.

Managing Risk: Pollution Prevention and Management

Addressing E-waste through Tracking, Traceability and Circularity Approach: This session took place on Thursday, 18 February. It was co-convened with the Secretariat of the Basel, Rotterdam and Stockholm (BRS) Conventions and UNEP’s Private Sector Unit. The session, moderated by Charles Ross, The Economist Intelligence Unit, examined:

- Why e-waste continues to be a problem despite numerous efforts;
- The main drivers of e-waste becoming a global environmental challenge;
- Policies and regulatory mechanisms best suited to tackle e-waste;
- Dealing with the informal sector and informal practices to manage e-waste;
- The contribution of the sustainable management of e-waste to the circular economy;
- Avoiding the loss of valuable resources contained in e-waste;
- The role of regional cooperation in providing solutions to support those developing countries lacking capacities for dealing with e-waste;
- Industry’s role in dealing with e-waste sustainably; and
- Innovative solutions for e-waste from manufacturing and design perspectives.

Rolph Payet, Executive Secretary, BRS Conventions, said the Basel Convention provides the regulatory framework for transboundary movements of e-waste to countries that have the capacity to provide environmentally sound management. He

noted the international community has a responsibility to address e-waste holistically and provide opportunities for countries and industries to reduce the impact of such waste.

Pascal Leroy, Director General, International Association of Electronic Waste Producer Responsibility Organisations, said annual e-waste generation is a growing concern as it is projected to rise from 54 million tonnes per year now to 70 million tonnes per year by 2030. He noted e-waste is “more than just a contamination and health concern.” Addressing it, he said, involves recovering critical raw materials that come from risky sources and lowering the carbon footprint of equipment.

Michel Tschirren, Senior Policy Advisor, International Chemicals and Wastes Management Division, Federal Office for the Environment, Switzerland, said the reason why e-waste continues to be a challenge despite growing international efforts is lack of information about transboundary movements, which makes it difficult to direct e-waste to places where environmentally sound management can be assured. Tschirren said many actors have a role to play in tracking and tracing e-waste, including producers, retailers, distributors, traders, recyclers, and governments. He underscored the role the Basel Convention could play in helping parties implement tracking and tracing procedures.

Olga Speranskaya, Senior Adviser, International Pollutants Elimination Network, said there are too many electronic products on the market, with some designed to become waste after a single use. She urged upgradability and repairability to make products last longer, as well as eliminating parts making it hard or impossible to recycle e-products. She called for producers to disclose harmful chemicals in their products and for setting international standards on restrictions of hazardous substances in e-products.

Speranskaya underscored the Basel Convention’s importance as the global framework that guides the life cycle of e-waste, and suggested companies and governments “think twice” about exporting e-waste to countries unable to manage them.

Larke Williams, Foreign Affairs Officer, State Department, US, said while the Basel Convention has a lot to offer, it is ultimately up to national governments to ensure waste is managed properly. She said most waste is generated locally, so trade is not always the issue. Leroy said solutions should not come from



Rolph Payet, Executive Secretary, BRS Conventions

governments alone, noting that researchers and manufacturers have their roles to play. She further emphasized that international coordination needed goes beyond what the Basel Convention can do as a framework agreement.

Stating transboundary activities make managing e-waste disposal difficult, Cynthia Asare Bediako, Chief Director, Ministry of Environment, Science, Technology and Innovation, Ghana, underscored the need for stringent policy enforcement to tackle it. Trisha Beejai, Technical Officer – Waste, Environmental Management Authority, Trinidad and Tobago, emphasized countries should set national definitions of waste in order to make standards and policy development easier.

Noting countries have diverse definitions of e-waste, Seika Sanno, Deputy Director, Industrial and Hazardous Waste Management Division, Ministry of Environment, Japan, mentioned the work of the Basel Convention's Expert Working Group on technical guidelines on e-waste seeking to differentiate between waste equipment and devices shipped to be repaired or refurbished.

In ensuing discussion, participants highlighted the need for public information to raise consumers' awareness on e-waste and for a transparent and accountable e-waste tracking system.

Larke Williams stated the need for sustainable management of equipment through extraction of valuable materials at the end of equipment's useful life. She suggested investigating ways to extend equipment's useful life and incentivizing trade of used equipment in order to extend its life cycle.

Brendan Edgerton, Director, Circular Economy, World Business Council for Sustainable Development, underscored commitment, coordination, and collaboration as essential to overcoming barriers to using a circular economy approach to manage e-waste. He noted the creation of a platform and roadmap to assist companies in achieving this.

Vanessa Gray, Head of Environment and Emergency Telecommunication, International Telecommunication Union, stated the COVID-19 pandemic has highlighted society's reliance on electronics. She said the pandemic has also driven an increase in the consumption of electronic equipment. She urged increasing the recycling of global e-waste to reduce the use of virgin materials in electronic equipment.

Underscoring e-waste is the world's fastest growing waste problem, Carlos Silva Filho, President, International Solid Waste Association, said the cost of monitoring, tracking, collecting, recycling, and recovery is an ongoing issue. He urged greater government attention to this problem, lamenting the lack of national programmes to recycle e-waste in a safe and environmentally sound manner.

Tschirren cautioned e-waste is the fastest growing waste stream that relies on estimates, calling for data to ensure estimates are refined and accurate to tackle the problem effectively. He noted the Governments of Switzerland and Ghana have proposed that all transboundary movement of e-waste be controlled by the Basel Convention, stating that "hazardous or not, if [e-waste] ends up in the wrong place, it can still be damaging to the environment and human health."

Bruce Anderson, Managing Director for Global Electronics Industry, IBM, said if product longevity can be prolonged and tracking and tracing ensured, e-waste would be reduced. He suggested governments ensure "the ability to repair or the right to repair."

Shalini Sharma, Co-Founder and CEO, Sanshodhan: An E-Waste Exchange Pvt Ltd, India, explained her company is an online platform created in the wake of India's 2016 extended producer responsibility law. The company links consumers with authorized e-waste recyclers, helping map digital materials flow in the process.

On how extended producer responsibility can be given more room in regulatory space, Leroy said while under European legislation producers have individual responsibility for take-back, they can work together in collective schemes. Sanno said under Japanese legislation, processing e-waste requires a license except where producers process their own end-of-life products, so their cost is lower.

Silva Filho stressed the need to emphasize circularity in product design and take a lifecycle approach that promotes true circular solutions. Anderson mentioned that AI is now being used to score product designs on whether they would be recyclable.

Ross concluded the session stating that "if we cannot measure it, we cannot manage it," and much work remains to be done on tracking and tracing. He said countries must become better at monitoring products throughout their lifecycle, transboundary movements are a big challenge requiring global cooperation, and consumers need to change their habits and expectations as part of the solution.

Marine Litter and Microplastics Mitigation and

Prevention: This session took place on Friday, 19 February. It was co-convened with the Global Partnership on Marine Litter. Charles Ross, The Economist Intelligence Unit, moderated the session. Participants examined:

- the latest science on the risks posed by marine litter and microplastics for ecosystems, human health, and society;
- the urgent policy action required at the multilateral and national levels to manage and mitigate the risk of marine litter in our environment;
- the role of innovation, technology, and finance; and



Moderator **Charles Ross**, The Economist Intelligence Unit

- multi-stakeholder cooperation in the management and mitigation of marine litter and microplastics-related risk.

Leticia Carvalho, UNEP, stressed three messages: marine litter is “wreaking havoc” on the world’s oceans; while COVID-19 has resulted in a surge of plastic consumption and litter, it also presents an opportunity to build back better; and the time to act is now.

Jacqueline McGlade, Lead Author, UNEP Global Assessment on Marine Litter and Microplastics, presented the principal findings of the forthcoming assessment. She said its main outcome will be a comprehensive global framework tackling marine litter and plastics in a holistic manner.

Melissa Wang, Greenpeace, said the global scientific community has sent a clear message that deep and systemic solutions are required to significantly reduce plastics production. She stressed a global treaty is needed to address market failures and impose extended producer responsibility.

Noting plastic pollution is a human rights issue and an effect of colonialism, Tina Ngata, Environmental and Indigenous Rights Advocate, Women Major Groups Representative, called for a “major” UN treaty on plastics. She stressed there can be no inclusion of indigenous knowledge without indigenous peoples, and said UN treaties must include not only indigenous knowledge, but “indigenous scientists” as well.

Gabriel Thoumi, Director of the Plastics Programme and Financial Markets, Planet Tracker, cautioned that companies are not reporting the risks their waste brings and lack sector-wide strategies on plastic waste. He noted the need for “plastic retooling” by moving from single-use plastics to recyclable, reusable, and refillable containers.

Juan Bofill, Senior Engineer in the Water Management Division, European Investment Bank, presented the Clean Oceans Initiative, which identifies projects that fight plastic waste in rivers, seas, and on land, and has the goal to finance EUR 2 billion worth of public and private sector projects by the end of 2023.

Patrick Labat, Senior Executive Vice President, Northern Europe, Veolia, underscored the need for incentives for recycling. He cited the example of Germany, where consumers receive payment per plastic bottle returned to the store, resulting in 95% of plastic bottles being recycled.

Heidi Savelli, Programme Management Officer, GPML, UNEP, said the Global Partnership on Marine Litter is a multi-stakeholder partnership bringing together all actors working to prevent marine litter and microplastics, by identifying gaps and emerging issues, among other actions.

Saiful Ridwan, Chief, Enterprise Solutions, UNEP, explained the GPML’s key features include: distributed and open data capture; integrated and smart search of content; personalization and learning; validated and curated publishing; integrated geospatial data mapping, layering, and analysis features; and smart matchmaking among stakeholders.

Nicholas Holmes, Chief Technology Officer for Global Government, IBM Cloud and Cognitive Software, said marine litter issues should not solely be viewed from a government

perspective, but also from an industry perspective. Holmes noted technology can move data beyond dashboards, towards data that can tell stories and lead to transformative action. He highlighted the importance that AI be combined with data, saying this would eliminate data silos.

Audrey Hasson, Head, GEO Blue Planet European Office, noted all datasets should be comparable end to end. She said monitoring marine litter is key, and modeling and AI can be used to extract information from data to assess impacts on the food chain and economies, and guide and assess the effectiveness of policies.

Satoru Lino, Deputy Director, Office of the Marine Environment, Ministry of the Environment of Japan, discussed progress in the *Ad Hoc* Open-ended Expert Group on Marine Litter and Microplastics. He said a chair’s summary emphasizes further expanding, accumulating, and sharing of scientific knowledge on marine litter, stressing this is key to ensure evidence-based and science-based policy approaches.

Ahmed Fathy, UNEP MGCY, said policy changes to address marine litter in Egypt came about as a result of civil society’s engagement with the government.

Rahuldeep Singh, UNEP MGCY, noted single-use plastics are waste by design, and called for improved monitoring of marine litter.

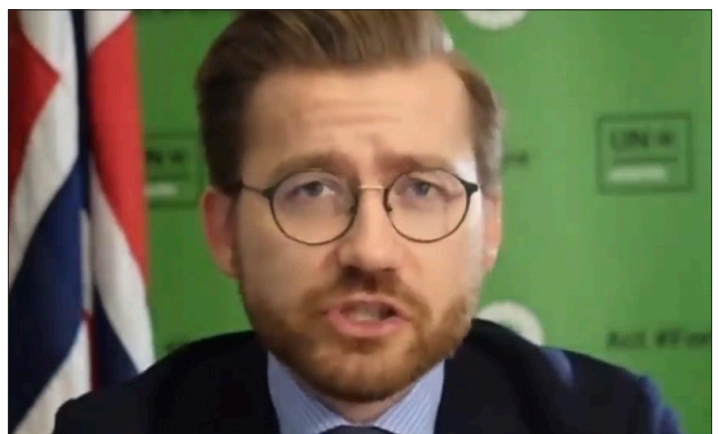
Among key takeaways from the session, Ross highlighted:

- While it is encouraging to see the many initiatives, better coordination is needed to be more effective in meeting SDG target 14.1 on marine waste;
- Monitoring and evaluation of the different initiatives are rare; and
- Too much information may make it difficult for governments to engage and understand what needs to be done.

Closing Session: Environmental Multilateralism: Science for Policy, Innovation and Action

This session was moderated by Axel Threlfall, Reuters. It aimed to address where we are now, versus where we need to be.

Inger Andersen, Executive Director, UNEP, said biodiversity loss, climate change, and pollution should be addressed in unison, with cohesive cooperation required across sectors and



Sveinung Rotevatn, Minister of Environment and Climate, Norway



Jeanne d'Arc Mujawamariya, Minister of Environment, Rwanda

among stakeholders. She lauded the private sector's increasing involvement in addressing environmental issues.

Sveinung Rotevatn, Minister of Environment and Climate, Norway, and President of UNEA-5, stated COVID-19 has not distracted leaders from long-term environmental challenges, and noted the EU has adopted the European Green Deal and the US has rejoined the Paris Agreement on climate change. He highlighted the role of innovative partnerships to ensure all stakeholders are involved in both the discussions and solutions.

Yasmine Fouad, Minister of Environment, Egypt, said we need to determine how to change our consumption patterns to lead more sustainable lives. She urged "restarting" economies, with the ecosystem approach as their basis.

Jeanne d'Arc Mujawamariya, Minister of Environment, Rwanda, said UNEP should be supported in its role as a key connector in mobilizing the required resources to tackle the various environmental challenges and building back better after COVID-19. She said Rwanda believes it can recover with the right investments such as in renewable energy and climate change adaptation, but cautioned solidarity is key, since "if we do not all become resilient, none of us will be."

Mohamed Mubarak Bin Daina, Chief Executive, Supreme Council for Environment, and Special Climate Envoy, Bahrain, observed the necessary infrastructure, such as multilateral agreements, is already in place to address key environmental challenges, but more work is needed on mobilizing finance and promoting technology transfer. He stressed the need to pay particular attention to least developed countries and small island developing States, including through more funding through the GEF and Green Climate Fund.

Asked by Threlfall what role business can play in promoting the changes needed, Jim Whitehurst, President, IBM, said business can lead through advocacy and by example. He suggested that solving the climate, biodiversity, and waste challenges will require systemic thinking and significant innovation, and since business drives a large amount of innovation, this means governments need to work with business. He also urged governments to create the conditions and

incentives for more collaborative open-source projects aimed at addressing key environmental challenges.

Asked by Threlfall how the world can best leverage post-COVID-19 green recovery, Rotevatn said when governments provide recovery stimuli, they face a choice between building back better or "moving along as if nothing happened." He suggested a good starting point would be to remove fossil fuels subsidies and instead emphasize investment in renewable energy. Andersen agreed on the need to target stimulus packages towards building back better while ensuring no one is left behind and the jobs created are green and sustainable.

Fernando Coimbra, Chair, UNEP Committee of Permanent Representatives, said the current environmental challenges require even more collective action following "the very clear roadmap" of the 2030 Agenda, with a stress on implementation. He suggested focusing closely on assisting developing countries to leapfrog to more SCP.

Maria Ivanova, Director, Center for Governance and Sustainability, University of Massachusetts, US, said UNEP should "stick to being the pinch of silver that provokes mighty reactions around the UN system." She observed the UN-SPBF is an example of what UNEP must work more to be: a body that connects and brings together all actors, including ordinary citizens, to collaborate towards finding solutions to environmental challenges.

Tina Brimpili, Deputy Executive Director, UN Convention to Combat Desertification, underscored the need for a global agreement on finance and technology to enable developing countries to achieve environmental goals. She stressed the UN needs to be "an honest broker" that brings consensus between science, policy, and diplomacy.

Bob Watson, Environmental Scientist and Former Chair, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, stressed biodiversity and climate are not only environmental, but also economic, social, moral, and peace and security issues and thus need to be considered in an integrated manner. Noting the world has not fully achieved any of the Aichi Biodiversity Targets and is not on track to achieve the Paris Agreement, he said we need to reduce greenhouse gas



Yasmine Fouad, Minister of Environment, Egypt

emissions by at least 50% by 2030 and not only conserve but also restore biodiversity.

Mubarak Bin Daina, highlighted the economic potential of green technologies by underlining that Elon Musk became the richest man in the world by selling electric cars.

Presenting Signify's commitment to the European Green Deal, Harry Verhaar, Head of Global Public and Government Affairs, for Signify's CEO, highlighted that the international community cannot afford to lose in the COVID-19 crisis, but instead needs to use it to build back greener.

Responding to comments and questions, Whitehurst said carbon taxes could make businesses focus on environmental actions. He expressed readiness to work with governments to develop a set of accounting standards that address businesses' impact on the environment, keeping the private sector accountable.

Yugratna Srivastava, Facilitator, UNEP MGCY, stressed the environmental agenda cannot be set only by those who have been in charge of managing the environment over the past 50 years, but needs to be shaped together with youth who will be managing it over the next 50 years. Participants agreed that nothing can be done for youth without youth.

In conclusion, Threlfall said the discussion underlined the importance of solidarity, collaboration, trust, and proactive partnerships. Among other key takeaways from the closing session, he highlighted:

- UNEP must continue to be the connector on environmental issues; and
- The UN-SPBF is an important part of the connector "mission," and this mission is bearing fruit.

He closed the session at 6:52 pm EAT.

Green Jobs and Green Entrepreneurship: The Future We Want and the Launch of the Youth and Children UN-SPBF Working Group

This event was held as a pre-session to the Forum on 18 February. It was co-convened with the UNEP MGCY, UNEP Partnership for Action on Green Economy (PAGE), and the International Labour Organization (ILO). Gyubin Hwang, MGCY Steering Committee, and Edie Threlfall, youth advocate, moderated the session.

The event addressed:

- the environment as a driver for job creation;
- green economy underpinning a green future for young people;
- changing macroeconomic policies to encourage green jobs;
- policies and actions to address skills shortages for green jobs;
- conditions for creating and sustaining green jobs post-COVID-19;
- key challenges and opportunities of green entrepreneurship; and
- the role of green entrepreneurship in addressing environmental and social challenges.

Asad Naqvi, Head of the Secretariat, UNEP PAGE, delivered three key messages: the environment is the foundation of the economy; policies play a crucial role in transitioning towards



Youth advocate **Edie Threlfall**; **Brendan Edgerton**, Director, Circular Economy, World Business Council for Sustainable Development; and **Inger Andersen**, Executive Director, UNEP

a sustainable economy; and business is the biggest player in economic growth and job creation.

Jin Tanaka, UNEP MGCY, said youth are highly engaged in environmental protection and climate action, but need "other sectors" to cooperate.

Moustapha Kamal Gueye, Coordinator, Green Jobs Programme, ILO, reported the ILO analyses show there is no trade-off between greening the economy and creating jobs. In the energy sector alone, he said, shifting from fossil fuels to green energy, accelerating energy efficiency, and deploying electric vehicles can create 24 million jobs. He called for a skills transition to align educational systems with the jobs of the future.

Shreya Ramachandran, The Grey Water Project, said greater efforts must be made to encourage participation of women and girls in green entrepreneurship and to raise youth's interest in green jobs. Kamal Gueye added gender disparities must be addressed through policy intervention.

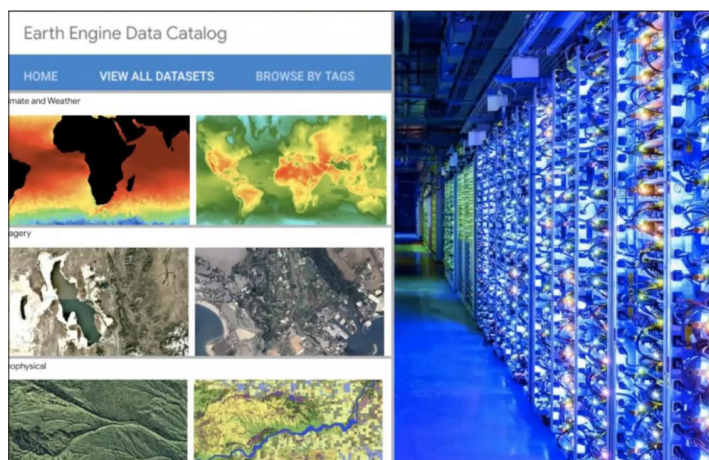
Jaee Nikam, GEO for Youth author, Research Associate, Stockholm Environment Institute Asia, outlined challenges she faced on the job market. She described the GEO for Youth report as an effort to correct these challenges by, for example, outlining paths for young green entrepreneurs to access knowledge and resources more easily.

Saad Uakkas, International Federation of Medical Students Associations, called for more spaces for young people to discuss the green economy.

Edie Threlfall then introduced three young entrepreneurs who discussed their efforts to address environmental challenges.

Cassandra Delage, Founder and CEO, Plast'if, said Plast'if developed a machine showcasing the full recycling process, turning plastic into 3-D printing. Delage said this assists companies with their ecological transition by encouraging their staff to recycle and 3-D print commonly used objects.

Dhruv Khanna, Triton Foodworks, said the ecological impact of his company's proprietary hydroponics and vertical farming systems included: saving six billion liters of water so far; being



pesticide-free; and providing safer-to-eat fruits and vegetables year-round in regions where supply is limited.

Steven Shutong Jiang, Founder and CEO, Soarability, said his company developed aerial and ground vehicle-based systems that detect gases and particles in real time. He said young entrepreneurs must believe in their ideas at the start, regardless of how supportive others might be.

Susan Mute, MGCY, highlighted the need to reduce reliance on raw materials, increase government support for young green entrepreneurs, and strengthen environmental assessments of businesses' impact.

On energy efficiency, Kamal Gueye said developers pay more for building designs that are more efficient while the subsequent users reap the benefits. He called for government regulation and incentives to lower the cost of developing more efficient designs.

Launching the Youth and Children UN-SPBF Working Group, Saad Uakkas called for UNEP to reflect its commitment to youth engagement in its programme and budget and foster an open and inclusive dialogue with the UN-SPBF and youth. He called for the UN-SPBF to remain open to supporting youth-led initiatives.

Shereen Zorba, UN-SPBF, closed the session, stating:

- Children and youth are the future, and “the future is now”; and
- Technology acceleration can help young people bring knowledge and generate opportunities to help create a better world than the one they inherit.

Upcoming Meetings

Innovate4Climate: Innovate4Climate (I4C) is a global conference that promotes dialogue among the public and private sectors on innovative ways to mobilize finance towards climate action. Leaders from government, industry, business, finance, and technology gather to envision the next generation of climate-smart solutions with the potential to transform the global economy. I4C provides a platform for exchange of knowledge and best practices; promotes investment opportunities in mitigation, adaptation, and resilience; and matchmakes between organizations in an apolitical and business-supportive environment. Innovate4Climate is hosted by the World Bank

Group. **dates:** 25-27 May 2021 **location:** Barcelona, Spain **www:** <https://www.innovate4climate.com/>

G20 Urban 20 Summit 2021: Urban 20 is a city diplomacy initiative that brings together cities from Group of 20 (G20) member States under a common framework to discuss global economic, climate, and development issues. The U20 cities commit to working together with national governments to address the most pressing challenges our world is facing, including rising inequalities, the climate emergency, and COVID-19 recovery. The cities issue a position and recommendations for consideration by the G20 presidency and Heads of State and Government, enhancing the role of cities as global economic and political leaders. The U20 initiative is facilitated by C40 Cities, in collaboration with United Cities and Local Governments. **date:** 12 June 2021 **location:** Rome, Italy **www:** <https://www.g20.org/en/riunioni-ministeriali.html>

Sustainability Research & Innovation Congress 2021: The Sustainability Research & Innovation Congress 2021 (SRI2021) is a transdisciplinary gathering that provides a platform for advocacy for sustainability scholarship, innovation, collaboration, and action. Discussions address topics ranging from climate resilience building, the SDGs, and sustainable fashion to the role of biodiversity in promoting transformative change, and data for a sustainable future. **dates:** 12-15 June 2021 **location:** virtual and Brisbane, Australia **www:** <https://sri2021.org/>

UN Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum): The fifth meeting of the STI Forum will take place in May 2021 in New York, US, during the 2021 session of the ECOSOC. The meeting was originally scheduled to convene from 12-13 May 2020, during ECOSOC's 2020 session, but was cancelled due to the COVID-19 pandemic. **dates:** 4-5 May 2021 **location:** New York City, US **www:** <https://undocs.org/en/E/RES/2021/1>

Partnering for Green Growth and the Global Goals 2030 (P4G) Summit: This Summit, hosted by the Republic of Korea, will bring together high-level government officials, CEOs, and civil society leaders to deliberate on how scalable and replicable market-based solutions can advance increased ambition on climate action and sustainable development. **dates:** 30-31 May 2021 **location:** TBC **www:** <https://p4gpartnerships.org/content/p4g-seoul-summit>

Fifth Meeting of the International Conference on Chemicals Management (ICCM5): The top decision-making body of the Strategic Approach to International Chemicals Management (SAICM) will consider a possible post-2020 platform for addressing chemicals and waste. **dates:** 5-9 July 2021 **location:** Bonn, Germany **www:** <http://www.saicm.org>

Basel Convention COP15, Rotterdam Convention COP10, and Stockholm Convention COP10: The 15th meeting of the COP to the Basel Convention, the 10th meeting of the COP to the Rotterdam Convention, and the 10th meeting of the COP to the Stockholm Convention will convene back-to-back. The meetings will include joint sessions covering matters of relevance to at least two conventions, separate sessions of the meetings of

UN SCIENCE-POLICY-BUSINESS FORUM ON THE ENVIRONMENT

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each of the three COPs, and a high-level segment. The theme is “Global Agreements for a Healthy Planet: Sound management of chemicals and waste.” **dates:** 19-30 July 2021 **location:** Geneva, Switzerland **www:** <http://www.brsmeas.org/>

UN Biodiversity Conference (CBD COP 15): The conference will include the 15th meeting of the COP (COP 15) to the CBD, the tenth Meeting of the Parties to the Cartagena Protocol on Biosafety (Cartagena Protocol COP/MOP 10), and the fourth Meeting of the Parties to the Nagoya Protocol on Access and Benefit-sharing (Nagoya Protocol COP/MOP 4). The meeting will review the achievement and delivery of the CBD’s Strategic Plan for Biodiversity 2011-2020. It is anticipated that the final decision on the post-2020 Global Biodiversity Framework will be taken, together with decisions on related topics including capacity building and resource mobilization. **dates:** second quarter of 2021 (TBC) **location:** Kunming, China **www:** <https://www.cbd.int/meetings/COP-15>

2021 UN Food Systems Summit: Convened by the UN Secretary-General, the Summit aims to maximize the co-benefits of a food systems approach across the 2030 Agenda and address the challenges of climate change. The Summit will provide a platform for ambitious new actions, innovative solutions, and plans to transform food systems and leverage these shifts to deliver progress across all of the SDGs. **dates:** September/October 2021 (TBC) **location:** TBC **www:** <https://www.un.org/en/food-systems-summit>

UN Climate Change Conference (UNFCCC COP 26): The 26th session of the Conference of the Parties (COP 26), the 16th meeting of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP 16), and the third meeting of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA 3) will convene one year after its originally scheduled dates. **dates:** 1-12 November 2021 **location:** Glasgow, UK **www:** <https://unfccc.int>

Barcelona Convention COP 22: The 22nd Meeting of the Contracting Parties to the Barcelona Convention and its Protocols is scheduled to take place in December 2021. Among the issues COP 22 is expected to discuss are: assessing and controlling marine pollution; ensuring sustainable management of natural

marine and coastal resources; protecting the marine environment and coastal zones through preventing and reducing, and, as far as possible, eliminating pollution; protecting natural and cultural heritage; strengthening solidarity among Mediterranean coastal States; and contributing to improving quality of life. **dates:** 7-10 December 2021 **location:** Antalya, Turkey **www:** <https://www.unenvironment.org/uneppmap/meetings/calendar>

Resumed Session of UNEA-5: Convening under the theme, “Strengthening Actions for Nature to Achieve the SDGs,” the resumed session will provide a platform for discussing and implementing nature-based solutions that contribute to the achievement of the 2030 Agenda by holistically addressing its social, economic, and environmental dimensions. Building on the Online Session of UNEA-5 in February 2021, the meeting will discuss ways to ensure that policies for economic recovery following COVID-19 lead to a resilient and inclusive post-pandemic world. A session of the Global Major Groups and Stakeholders Forum is also planned to precede the meeting.

dates: February 2022 (TBC) **location:** UNEP, Nairobi **www:** <http://web.unep.org/environmentassembly>

For additional meetings, see <https://sdg.iisd.org/>

Glossary

AI	Artificial Intelligence
GEO	Group on Earth Observations
GEOBON	Earth Observation Biodiversity Network
GPML	Global Partnership on Marine Litter
MGCY	Major Group for Children and Youth
R&D	Research and Development
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
UNEA	UN Environment Assembly
UNEP	UN Environment Programme
UN-SPBF	UN Science-Policy-Business Forum on the Environment