GLOBAL BIOECONOMY SUMMIT 2024

23 – 24 October 2024, Nairobi, Kenya

Safari Park Hotel

Global Bioeconomy Summit 2024 Conference Report

One Planet – Sustainable Bioeconomy
Solutions for Global Challenges

This report was made by Stockholm Environment Institute(SEI), BioInnovateAfrica and the International Advisory Council for the Global Bioeconomy Summit (IACGB) with financial support from the Swedish International Development Cooperation Agency (Sida)

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Preface

The Global Bioeconomy Summit (GBS) held from 23-24 October 2024 in Nairobi, Kenya in East Africa, marked a historic chapter in the advancement of the global bioeconomy. It was the first time we held the Global Bioeconomy Summit (GBS) outside Germany since the beginning of the biennial GBS series in 2015.With a spotlight on Africa and the global south, GBS 2024 presented unprecedented opportunities to engage global leaders, innovators, and experts in a collaborative effort to explore bioeconomy solutions that drive positive, lasting change in countries and regions around the world.

The bioeconomy is the production, utilization, conservation, and regeneration of biological resources, including related knowledge, science, technology, and innovation, to provide sustainable solutions within and across all economic sectors and enable a transformation to a sustainable economy. It has emerged as one of the economic growth models that fosters sustainable development and addresses global challenges such as climate change, food security, and the conservation of resources.

This report highlights the deliberations at the GBS2024 and emphasised the importance of resilient and sustainable food systems, biodiversity conservation efforts, and biological resource innovations in meeting the Sustainable Development Goals 2030, as well as the longer-term transition to a sustainable future economy. Delegates discussed bioeconomy as a driver for new economic opportunities, especially skills and jobs for the youth. Sessions included cross sectoral topics e.g., agri-food systems, forestry, ocean/aquatic resources, biomanufacturing, biopharma, biotechnology, biomaterials, and bioenergy; impacted environments e.g., ecology, consumer products, construction, and urban design; and supporting mechanisms e.g., policies, standards, carbon emissions measurement and certifications, and analyses of bioeconomy strategies and roadmaps.

GBS 2024 emphasised bioeconomy as a future growth strategy. It was an exceptional networking opportunity for scientists, entrepreneurs, policy makers, philanthropists, development workers, media, and civil society advocates who showcased the latest biologically based solutions for societal and industrial development. It presented a unique opportunity to foster future research and innovation collaborations on sustainable bioeconomy in Africa and globally.

As outlined in the GBS2024 communique, we recommend that countries, regions, industry, communities, and partners integrate bioeconomy strategies into economic policy, create a Global Bioeconomy Partnership bringing different existing initiatives together to share perspectives, facilitate development of standards for fast and broad market access for bioeconomy innovations, support regional and local initiatives to grow and connect with the global bioeconomy, and include teaching of bioeconomy principles and exemplars as part of all education levels.

We invite you to continue the bioeconomy conversations and keep on building partnerships for advancing the global bioeconomy in your regions and countries until we meet again in the next GBS2026.

Professor Dr. Christine Lang *Dr. Julius Ecuru* *Dr. Elspeth MacRae*

Chairs of IACGB

Executive Summary GBS2024

The fourth Global Bioeconomy Summit (GBS) was held from 23-24 October 2024 in Nairobi, Kenya in East Africa, and marked a historic chapter in the advancement of the global bioeconomy. It was the first time the GBS was held outside Germany. The International Advisory Council for a Global Bioeconomy (IACGB) with East African cohosts East African Science and Technology Commission (EASTC), Stockholm Environment Institute/Africa Centre (SEI) and International Centre of Insect Physiology and Ecology (ICIPE)/BioInnovate Africa dedicated a plenary to a focus on Africa and the Global South as well as hosting ministers and key industry, academic and societal leaders.

With 569 in-person attendance from over 57 countries and 66 nationalities and over 2000 livestreaming, there were unprecedented opportunities to engage global leaders, innovators, and experts in a collaborative effort to explore bioeconomy solutions that drive positive, lasting change globally.

The Summit was opened by political leaders and high-level speakers representing the hosts IACGB and East-Africa. These included: Prof Dr Christine Lang, co-Chair of the IACGB; Dr Abdou Tenkouano, Director General of Icipe; Hon. Claudia Muller, Parliamentary State Secretary, Federal Ministry of Food and Agriculture, Germany; H.E. Ambassador Caroline Vicini, Swedish Ambassador to Kenya; and Hon. Dr. Andrew Karanja, Cabinet Secretary, Ministry of Agriculture and Livestock Development, Kenya.

The programme showcased “One Planet - Bioeconomy Solutions for Global Challenges!” with 120 speakers, 5 plenary sessions, 24 workshops and 12 exhibitions. 18 sponsors supported programme development, activities and attendance of delegates. Plenary sessions focussed on:

- Bioeconomy’s role and impact in today’s political, economic and ecological landscape
- The innovation ecosystem for Bioeconomy – finance, technologies and societal initiatives
- Bioeconomy, a pathway for strengthening agri-food systems resilience and climate action in Africa and the Global South
- Way forward: science, partnership, shared responsibilities and joint platforms: Bioeconomy in the Global Agenda
- Top level summaries, Communiqué and Debate

Pre-summit workshops were organized by third parties such as the International Bioeconomy Forum (IBF), World Economic Forum (WEF), Foundation Seeding the Future, and emphasized the truly global and inclusive mission of the 4th GBS.

In the plenary sessions, delegates from all hemispheres and bioeconomy sectors discussed bioeconomy as a driver for new economic opportunities, especially skills and jobs for the youth and local communities. Sessions included cross sectoral topics e.g., agri-food systems, forestry, ocean/aquatic resources, biomanufacturing, biopharma, biotechnology, biomaterials, and bioenergy; impacted environments e.g., ecology, consumer products, construction, and urban design; and supporting mechanisms e.g., policies, standards, carbon emissions measurement and certifications, and analyses of bioeconomy strategies and roadmaps, and highlighted best practice examples.

24 workshops organized by world leading bioeconomy expert groups took a deep dive into the overarching topics of “Advancing Knowledge and Innovation”, “Driving Industry and Markets”, and “Shaping the Global, Regional, and Local Bioeconomy”. These again – as in previous GBSs - turned out to be one of the key features of GBS, directly involving all 500 delegates.

GBS 2024 emphasised bioeconomy as a future growth strategy. It demonstrated unique opportunities to foster future research and innovation collaborations on sustainable bioeconomy in Africa and globally.

This was epitomised in the final plenary on the second day of the summit: announcement of a Statement of Intent for a Global Bioeconomy Partnership. With Bioeconomy being cross-sectoral and multi-disciplinary, the Partnership aims to involve a broad range of global, international or multi-national stakeholders, featuring sustainable bioeconomy development and to become a more formal Forum for future discussions and joint activities.

Key recommendations from the Summit as outlined in the GBS2024 Communiqué:

- countries, regions, industry, communities, and partners **integrate** bioeconomy strategies into economic policy,
- a Global Bioeconomy Partnership bringing different existing and future initiatives together to **share** perspectives,
- **development** of standards for fast and broad market access for bioeconomy innovations,
- regional and local initiatives to **grow and connect** with the global bioeconomy, and
- including **teaching** of bioeconomy principles and exemplars at all education levels.

For the first time a Youth Communiqué emphasising empowerment of Youth through education and inclusive policies, enhancing infrastructure and resources for sustainable development, and fostering regional and global collaboration and innovation. This was presented by the IACGB Youth Champions who also hosted a workshop and presented at their exhibition booth.

GBS2024 in Kenya was an insightful, forward looking and historic event for Africa and the global community, and we look forward to GBS2026 in Ireland.

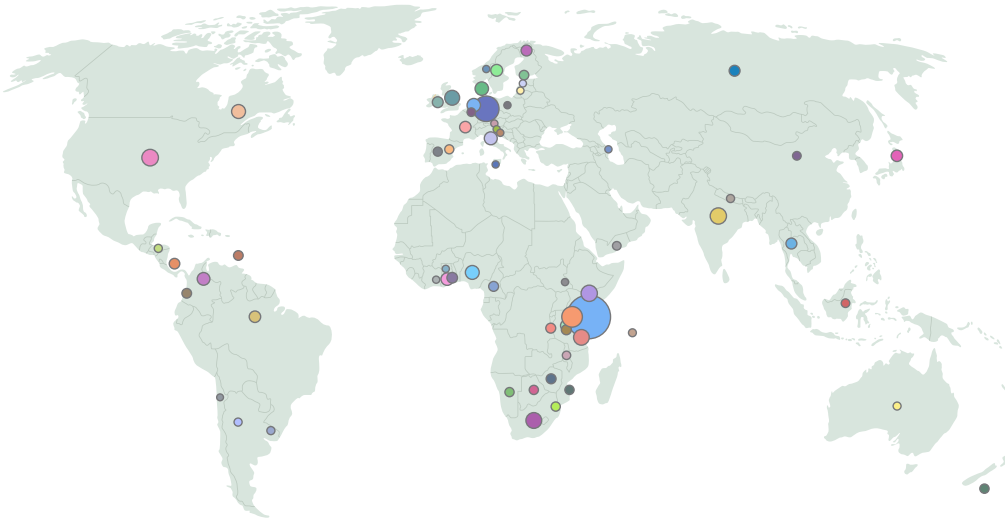
About the GBS 2024

GBS2024 was held in Nairobi, Kenya on 23–24 October 2024.

The overall theme of GBS2024 was: “One Planet – Sustainable Bioeconomy Solutions for Global Challenges”.

GBS2024 gathered leaders of bioeconomy from all hemispheres to highlight and discuss a sustainable bioeconomy as the key to decarbonisation and sustainable transition to less fossil fuel dependent, rural and urban green economies; while building resilient and sustainable food systems, reversing biodiversity loss, meeting health challenges, and using innovation as a driver for new economic opportunities, especially jobs for the youth.

Delegates



Nationality

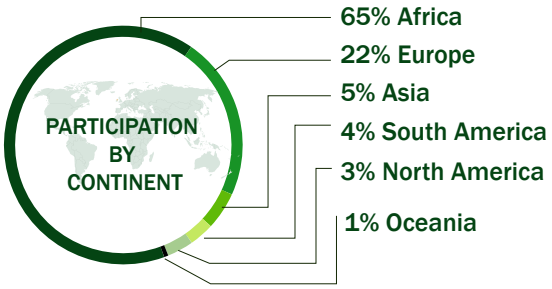
- Kenya
- Germany
- Uganda
- South Africa
- United States
- Ethiopia
- India
- Tanzania
- United Kingdom
- Denmark
- Nigeria
- Netherlands
- Canada
- Colombia
- Ghana
- Italy
- Brazil
- France
- Rwanda
- Sweden
- Thailand
- Cameroon
- Costa Rica
- Finland
- Japan
- Togo
- Burundi
- DRC
- Ireland
- Namibia
- Russia
- Zimbabwe
- Barbados
- Belgium
- Botswana
- China
- Ecuador
- Estonia
- Indonesia
- Mozambique
- New Zealand
- Portugal
- Spain
- Swaziland
- Yemen
- Argentina
- Australia
- Austria
- Azerbaijan
- Benin
- Burkina Faso
- Chile
- Croatia
- Guatemala
- Ivory Coast
- Latvia
- Lithuania
- Malawi
- Malta
- Nepal
- Norway
- Poland
- Seychelles
- Slovenia
- Sudan
- Uruguay

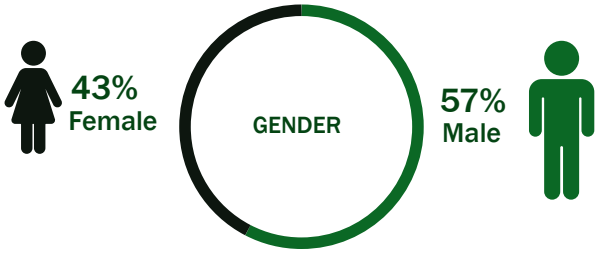
569

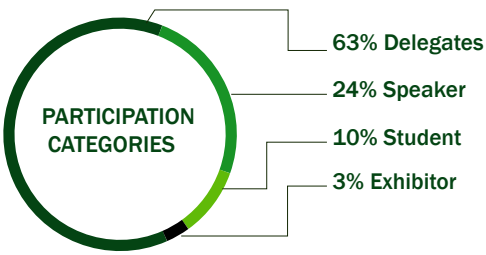
Inperson delegates from **57** countries and **66** nationalities

842

registered to attend online, but **> 2,000** followed the livestream on social media channels







Summary Report of the Plenary Sessions

This section is a summary of plenary presentation and panel discussions, A more detailed presentation of these can be found in the section 5 “Full Report of the Plenary Sessions” on page 30”

DAY 1

WEDNESDAY 23 OCTOBER 2024

Summary of Official opening and Welcome addresses

The 2024 Global Bioeconomy Summit in Nairobi, the first held outside Germany, was officially opened by key global and regional leaders all highlighted the significance of bioeconomy for sustainable development. They also commended the GBS for setting the stage for global dialogue and partnerships aimed at advancing sustainable bioeconomy development worldwide.

Prof. Christine Lang, Co-Chair of IACGB, welcomed participants and emphasized the growing global recognition of bioeconomy as a sustainable growth pathway, now part of G20 and G7 agendas. She encouraged collaboration to address climate change, biodiversity loss, and food insecurity. **Dr. Abdou Tenkouano, Director General of ICIPE,** underscored the relevance of bioeconomy in Africa, being an attractive andsustainable growth pathway and tackling youth unemployment. He highlighted the East African Community's pioneering bioeconomy strategy and called for cross-regional partnerships. **Bettina Stark-Watzinger, German Minister of Education and Research** highlighted the role of the GBS serving as a vital international platform for dialogue, idea exchange, and collaboration. She acknowledged the progress made in bioeconomy initiatives worldwide and commended Kenya for hosting the 4th GBS summit. **Claudia Mueller, Parliamentary State Secretary, German Ministry of Food and Agriculture,** reiterated Germany's commitment to the bioeconomy since 2010. She emphasized the need to balance ecology and economy, promoting food security, sustainable biomass use, and circular economy principles. **Ambassador Caroline Vicini, Swedish Ambassador to Kenya,** highlighted Sweden's long-term support for East African bioeconomy initiatives, such as BioInnovateAfrica and stressed the potential of the bioeconomy to drive inclusive growth by creating jobs and fostering collaboration between governments, academia, and private sectors on reaching key SDG targets. She specifically noted Sweden's initiatives in sustainable forestry and forestry value addition in East Africa. **Dr. Andrew Mwihia Karanja, Kenya's Cabinet Secretary for Agriculture and Livestock Development,** welcomed all delegates and stressed Kenya's bioeconomy engagement, particularly through the East African Community's regional bioeconomy strategy. He underscored the importance of connecting agriculture to value addition and processing industries and called for international collaboration to support innovation and policy development.

Plenary Session I

Bioeconomy's Role and Impact in Today's Political, Economic, and Ecological Landscape

Chairs, Prof Christine Lang and Dr Julius Ecuru, Co-Chairs, IACGB

Keynote Presentations

The presenters highlighted the bioeconomy's critical role in addressing global challenges, driving economic growth, and promoting sustainability. All three speakers viewed the bioeconomy as a transformative pathway to sustainable development,

Dr. Ertharin Cousin , Food Systems for the Future, USA, emphasized the bioeconomy's potential to transform food systems, create jobs, and enhance ecological resilience. She stressed the urgency of tackling food insecurity, which affects 2.4 billion people, and called for cross-sector collaboration, policy reforms, and increased financing to drive systemic change.

Prof. Måns Nilsson Stockholm Environment Institute, Sweden outlined the significance of the bioeconomy as a promising and novel strategy for sustainable growth, simultaneously addressing global challenges like climate change, biodiversity loss, and food insecurity while providing diverse opportunities for sustainable and inclusive economic development. He highlighted the importance of integrating modern technology with traditional knowledge systems, aligning policies with national contexts, and investing in innovation, public procurement, and youth engagement.

Carina Pimenta, National Secretary for the Bioeconomy, Brazil presented Brazil's bioeconomy strategy and G20 leadership prioritising forest economies, sustainable food systems, and the restoration of ecosystems while incorporating social and economic inclusion for indigenous and local communities. She pointed to the bioeconomy as a paradigm shift for economic and productive sectors, focusing on nature-driven solutions to tackle global challenges like biodiversity loss, climate change, and poverty. emphasizing its role in biodiversity conservation and climate action.

Panel Session: Bioeconomy's Role Today

The panel explored the ways in which the bioeconomy can drive socioeconomic change and improve livelihoods and how public awareness and understanding of the bioeconomy be improved.

In identifying key challenges and opportunities for advancing the bioeconomy, the panellist emphasised the need for strong promotive policies, financing, and innovation. **Fortunate Muyambi , Deputy Executive Secretary, East African Science and Technology Commission, Rwanda** stressed the importance of national and regional bioeconomy strategies, particularly in Africa, calling for investment in bioentrepreneurship and innovation with focus on value addition and scaling up initiatives. **Dr. Elspeth MacRae, Chair International Advisory Council on Global Bioeconomy, New Zealand** highlighted the urgency of urban redesign, trade transformation, and standardizing global bioeconomy metrics, while warning against resistance and pushback from fossil-based industries. She highlighted the opportunities for countries in the Global South to move away from outdated raw material supply chains and instead focus on producing value-added products locally. **Pekka Pesonen, Ministry of Agriculture and Forestry, Government of Finland** highlighted the need to enhance productivity in the bioeconomy, focusing on the need to use the currently utilized resource base more efficiently. **Prof. Joachim von Braun, Center for Development Research (ZEF), Bonn University, IACGB, Germany** argued that the urgent next step is to build bioeconomy bridges between the Biodiversity, Climate, and Food Systems Summits (COPs) as this is a viable approach to aligning these major agendas in a productive way. efforts should prioritize scaling up bioeconomy applications showcasing its value for meetings SDG targets. He also called for the establishment of a Global Bioeconomy Science Platform by the next GBS, enabling worldwide connectivity of bioeconomy-related science through a virtual platform with implementation capacity **Hierro Calvachi, IACGB Youth Champion, Ecuador** underscored the stressed the importance of inclusivity, particularly through empowering and engaging rural youth and youth empowerment, skill development, and regional collaboration, urging better connections between academia and industry. **Dr. Julius Ecuru, BioInnovateAfrica**, the session's co-chair, shared his final remarks, and the key points from the morning session which where (i) the importance of building bridges between different forums, fostering active engagement, and supporting the creation of a science-based bioeconomy platform; (ii) the need to incorporate traditional knowledge and address the social dimensions of the bioeconomy. (iii) the youth perspective and the importance of education and skills development to make young people competitive, entrepreneurial, and capable of building successful businesses and making fields like forestry, agriculture, and bio-based production more attractive and finally (iv) to effectively communicate the benefits of the bioeconomy to the public.

Plenary Session II:

The Innovation Ecosystem for Bioeconomy - Finance, Technologies and Societal Initiatives

Session Chairs: Dr Mary Maxon and Prof Ian O'Hara, IACGB

Keynote Presentations

Morton Engard Rasmussen highlighted bio solutions such as sustainable proteins, food waste reduction, and bioethanol production, stressing the urgency of scaling innovations, removing regulatory barriers, and increasing investment in clean technologies. He called for global collaboration, talent engagement, and stronger public-private partnerships to drive the transition to a bioeconomy.

Dr. Kelly Seagraves outlined the U.S. government's strategic bioeconomy approach, including the 2022 Executive Order, infrastructure investments, and federal procurement incentives. She emphasized the role of biomanufacturing, biomass hubs, and bipartisan legislative support in advancing sustainable bio-based industries, urging global partnerships to scale bioeconomic solutions.

Dr. Linda Davis shared her experience in building Kenya's ethanol-based bioeconomy, focusing on cassava farming, food security, and rural development. She pointed to challenges such as infrastructure gaps and funding barriers, advocating for shared financing, public-private partnerships, and integrated policy support to scale bioeconomy initiatives in Africa.

Franck Leroy, emphasised the need to protect natural resources, restore biodiversity, and develop sustainable economic solutions. He showcased France's Grand Est region as a bioeconomy leader, with advanced biorefineries, bio-based materials, and clean energy initiatives, stressing the importance of cross-regional collaboration to accelerate sustainable development worldwide.

Panel Discussion : Innovation in Bioeconomy Technologies and Finance

This session explored key strategies for advancing the bioeconomy through public-private partnerships, policy frameworks, food systems, financing, and youth engagement **Nicolo Jokomutzi Moore, Executive Director of Circular Bio-based Europe (CBE),** presented the CBE ,a partnership between the European Commission and the Bio-based Industries Consortium, which jointly have funded nearly 200 projects leveraging approximately €3 billion of funding. The focus being on scaling technologies to market, with initiatives ranging from pilot projects to flagship biorefineries. He identified financing, regulatory hurdles, and public perception as the biggest challenges for scaling EU bioeconomy technologies and stressed the need for stronger financial alliances, regulatory adaptations, and improved messaging to build market trust **Dr Lily Eurwilaichitr, Assistant Executive Director, National Science and Technology Development Agency, Thailand** highlighted Thailand's Bio-Circular-Green (BCG) Economy policy, integrating bioeconomy with circular and green growth models. She stressed microbial biodiversity's role in advancing biorefineries, biofuels, and regional collaborations like the ASEAN BCG Network and initiatives like the ASEAN Microbial Database **Mandla Nkomo, Chief Executive Director, Partners in Food Solutions, Zimbabwe** focused on the food system's central role in the bioeconomy, calling for greater dietary diversity, food waste reduction, and localized bioeconomy ecosystems in Africa. He emphasized the need to connect scientific research with practical applications to strengthen rural-urban food linkages. **Zhengzheng Qu, Program Manager at the UN Environment Program,** highlighted the finance gap in nature-positive investments, stressing the need to redirect harmful subsidies and mobilize private sector involvement. She stressed immature markets, and regulatory challenges as barriers to private investment, calling for public finance mechanisms like grants and guarantees to de-risk bioeconomy projects and attract private funding. **Hayley Ciantar an EU Bioeconomy Youth Ambassador from Malta** advocated for bioeconomy education, mentorship, youth involvement in decision-making and youth-driven awareness initiatives like the Bioeconomy Youth Vision and BioEconomy Matters podcast She also outlined four key steps to increase bioeconomy job opportunities: integrating bioeconomy topics into education, university-industry partnerships, accessible entry-level jobs, and supporting youth entrepreneurship. The session chair **Dr Ian O' Hara** concluded the session with some of his key takeaways, emphasizing innovation, policy frameworks, and financial accessibility as essential to advancing the bioeconomy. He called for reducing investment risks and creating an environment for scalable, nature-positive solutions.

DAY 2

WEDNESDAY 24 OCTOBER 2024

Opening Addresses: Welcome and Introduction to Day 2

Dr. Eliane Ubalijoro, CEO of CIFOR-ICRAF, emphasized agroforestry and forest-based bioeconomy solutions as essential for biodiversity conservation, climate resilience, and rural development in Africa. She advocated for public-private investment, circular bioeconomy principles, and community-driven carbon markets to enhance sustainability and economic growth.

Margrethe Vestager, Executive Vice President for Biotech and Biomanufacturing of the European Commission underscored the bioeconomy's potential to revolutionize industries, offering sustainable alternatives to fossil-based materials and advancing biotech-driven solutions. She highlighted Europe's commitment through the upcoming EU Biotech Act, regulatory harmonization, and global collaboration initiatives like DeSIRA and the G20 Bioeconomy Initiative.

Michael Kellner, Deputy Minister of Germany's Federal Ministry of Economic Affairs and Climate Action focused on industrial bioeconomy's role in the green transition, emphasizing climate-neutral innovations, sustainable raw material supply, and improved regulatory frameworks to drive bio-based economic growth. He stressed the importance of cross-border cooperation and global policy alignment, with platforms like the Global Bioeconomy Summit playing a crucial role in advancing sustainability strategies worldwide.

Plenary Session III

Bioeconomy, a Pathway for Strengthening Agri-food Systems Resilience and Climate Action in Africa and the Global South Session

Chairs: Prof Lucia Pittaluga and Ben Durham, IACGB

Introductory Speakers

Dr. Getachew Tadesse, Director of Operational Analysis at Academia 2063, highlighted the need to mainstream the bioeconomy into Africa's development policies, leveraging its potential for climate resilience, food security, and job creation. He stressed challenges such as knowledge gaps and limited policymaker engagement, calling for robust data, policy alignment, and public-private partnerships to drive bioeconomy adoption in Africa. **Dr. Julio Berdegué Sacristán, Minister of Agriculture and Rural Development, Government of Mexico** underscored Mexico's commitment to the bioeconomy as part of its industrial policy, aiming to decarbonize agriculture, create rural jobs, and attract private investment. He highlighted Mexico's efforts to map biomass resources, support SMEs, streamline regulations, and foster global collaborations. He also emphasized the importance of updating legal frameworks and strengthening governance structures to accelerate bioeconomy development.

Panel 1: Bioeconomy Policy Priorities for Equitable Global Development

Chairs: Prof Lucia Pittaluga and Ben Durham, IACGB

The panel discussion focused on Africa's bioeconomy potential, challenges, and policy priorities

Dr. Jean Jacques Muhinda, Alliance for a Green Revolution in Africa (AGRA), emphasized the need for sustainable intensification in agriculture, moving away from land expansion to protect biodiversity and fragile ecosystems. He stressed that policy integration are essential for scaling bioeconomy initiatives, increasing renewable energy and to create incentives for farmers shifting toward alternative production system and reducing post-harvest losses, and use **Dr. Peggy Oti-Boateng, Executive Director of the African Academy of Sciences, Ghana** called for investment in science, technology, and innovation (STI) to support research, build capacity, and integrate African knowledge systems into global bioeconomy research agenda.. She emphasized the need to build value chains, and improve data access, **Peter Minang, Africa Director (CIFOR-ICRAF), Kenya** highlighted the need to improve efficiency of biomass utilization, value addition and engaging African finance and industrial ministries in supporting SME growth and local bioeconomy industries. In protecting Africa's biodiversity, such as in the Congo Basin, poverty is a critical challenge and current investments have focused on conservation with limited support to sustainable food and timber production. Productivity per hectare has therefore stagnated leading to increased agricultural land expansion and biodiversity loss. He warned that without sustainable intensification, biodiversity loss will accelerate, and called for bioeconomy-driven solutions that support both livelihoods and conservation.

Panel 2: Innovation and Entrepreneurship in the African Bioeconomy

Chairs: Prof Lucia Pittaluga and Ben Durham, IACGB

The panel focused on bioeconomy-driven entrepreneurship and innovation, showcasing successful SMEs and startups from South Africa, Burundi, and Tanzania. **Dr. Daniel Ndima Chief Executive Officer, Cape Bio, South Africa** presented his AI-powered platform for biomolecule discovery from microbial biodiversity, which accelerates diagnostics and drug discovery. His company, supported by South Africa's Technology Innovation Agency, has already developed Africa's first PCR test and is expanding to global markets. **Dr. Ginette Karirekinyana Founder and CEO, Karire Products Ltd, Burundi** shared how her company commercializes plant-based products derived from catnip and Artemisia, creating jobs for local farmers and combating malaria in Burundi. With support from BioInnovate Africa, her social enterprise has reduced malaria epidemics and contributed to public health and economic development in Burundi. **Prof. Karoli Nicholas Njau founder and CEO of ENVSOL Ltd, Tanzania** presented his dual-reactor technology for wastewater treatment and bioenergy recovery, designed to support low-cost, efficient biogas and fertilizer production. His innovation improves data reliability for bio-digestion research while reducing dependence on expensive foreign technologies.The session the panel praising these startups for solving human development challenges and stressed that an SME-driven bioeconomy is key to economic growth in Africa.

Panel 3: Bioeconomy Pathways in Africa, Latin America, and Asia

Chair Dr Francis X. Johnson, Senior Research Fellow Stockholm Environment Institute, Sweden

The panel explored diverse bioeconomy strategies across Africa, Latin America, and Asia, emphasizing regional priorities, policy frameworks, and sustainable development goals. **Monica Trujillo Stockholm Environment Institute, Colombia** highlighted Latin America's bioeconomy models, ranging from biotechnology-driven agriculture to biodiversity-based approaches. The Amazon's rich biodiversity and critical ecosystem services face severe threats making sustainable bioeconomy solutions essential combining biodiversity conservation and climate action but also ensuring job, income generation, and improved livelihoods. She also presented the recently established Latin American Bioeconomy Network fostering collaboration, knowledge exchange, and capacity building across over 60 institutions in the region. **Fortunate Muyambi, East African Science and Technology Commission (EASTECO),** outlined the East African Regional Bioeconomy Strategy, prioritizing food system resilience, bio-based healthcare, biobased industrial innovation, and sustainable bioenergy. He emphasized the importance of value addition, waste management, and bioeconomic data-sharing initiatives, such as the Bioeconomy Observatory and Regional Status Reports. **Dr. Warithorn Sankasiri, National Center for Genetic Engineering and Biotechnology Thailand** provided insights into Thailand's Bio-Circular-Green economic model, which integrates bioeconomy with circular and green principles. She showcased the cassava starch net-zero emission roadmap, which leverages technological innovation, regional coordination, and knowledge sharing to create a sustainable cassava value chain in South East Asia **Dr. Aisha M. Nakitto, AKADEMIYA2063, Africa** linked the bioeconomy to the African Union's Agenda 2063, emphasizing youth-driven enterprises, value-added industries, and climate-resilient economies. She highlighted policy options for advancing Africa's bioeconomy, including cross-sectoral partnerships, investment in research, and capacity building.

Session chairs Lucia Pittaluga and Ben Durham concluded the whole session by emphasizing the need for strong public bioeconomy policies that balance bioproduct development, environmental sustainability, and social equity. Public-private partnerships were highlighted as essential for advancing the bioeconomy, but financing gaps remain a key barrier for startups. Lucia Pittaluga stressed the uncertainty around green job creation, calling for further research on job quality and availability in the Global South. Ben Durham noted that South Africa will advance its bioeconomy agenda as the next G20 president and highlighted the IACGB Communique as a guiding vision for bioeconomy development.

Plenary Session IV:

Way Forward: Science, Partnership, Shared Responsibilities and Joint Bioeconomy Platforms

Session Chairs: Dr Órlaith Ni Choncubhair and Hugo Chavarria, IACGB

Introductory Speakers

Dr. Maximo Torero Chief Economist, FAO emphasized that rising biomass demand requires transformative resource management and that agrifood systems are central to bioeconomy development. He highlighted the need for innovation to improve food production efficiency while protecting ecosystems, empowering smallholders through sustainable practices. A just transition is essential, ensuring equitable opportunities for marginalized groups. FAO, as a global bioeconomy leader, is working to align initiatives like the G20, COPs, and multistakeholder partnerships to drive systemic change.

Ambassador André Corrêa do Lago, Secretary for Climate, Energy, and Environment at Brazil's Ministry of Foreign Affairs reaffirmed Brazil's commitment to bioeconomy leadership, highlighting the G20 Initiative on Bioeconomy and its 10 guiding principles. He stressed integrating science and traditional knowledge to ensure environmental, economic, and social balance. He also pointed to COP30 in the Amazon as an opportunity to showcase sustainable forestry as a key solutions to global challenges.

Prof. Xian-En Zhang, Shenzen University of Advanced Technology, China discussed synthetic biology's transformative impact on biotechnology and the bioeconomy. He outlined breakthroughs in AI-driven protein design and metabolic engineering, leading to sustainable materials, plant-based medicines, and rapid vaccine development. He emphasized China's proactive role in synthetic biology research and governance, positioning it as a key driver of next-generation bio-manufacturing.

Vikash Abraham Chief Strategy Officer of Naandi, India highlighted efforts to transition small-scale farmers to regenerative agriculture through philanthropy, social businesses, and carbon financing. Naandi's digital tools and farm hubs provide affordable, sustainable inputs and market access, ensuring traceability and high-quality, low-carbon produce. He stressed rethinking plant nutrition and redesigning food systems to align with nature and long-term resilience.

Panel 1: Bioeconomy Transformation

Talash Huijbers. Founder & CEO, InsectiPro Ltd, Kenya showcased the role of insects in circular food and feed systems, emphasizing their environmental benefits, efficiency, and role in waste recycling. Her company supports farmers with organic fertilizers and regenerative agricultural practices, reducing carbon emissions and enhancing sustainability. **Prof. Stephanie Baumberger Universite Paris-Saclay, France** argued that science is crucial for bioeconomy development, not only for innovation but also for assessing ecological impacts and informing policy. She stressed the growth of open-access research, promoting global collaboration. **Dr. Rose Mwebaza United Nations Environment Programme (UNEP), Uganda** emphasized Africa's rich biodiversity and bioeconomy potential, particularly through carbon markets, bio-industrialization, and regenerative agriculture. She called for youth inclusion and stronger partnerships, leveraging Africa's leadership in the G20 to integrate global bioeconomy strategies. **Anamika Dey, GIAN, India** highlighted the role of grassroots innovation, documenting traditional knowledge and local problem-solving practices. She emphasized the need for fair benefit-sharing and collaboration between innovators, entrepreneurs, and investors to bring bio-based solutions to market. **Lara Kotze-Jacobs Biomanufacturing Industry Development Centre, CSIR, South Africa** discussed the importance of supporting bioeconomy Start-Ups, providing scientific expertise, infrastructure, and workforce development to drive commercialization and job creation. **Dr. Francis Sullivan, Sustainable Biomass Program, UK/Canada** stressed the importance of meaningful partnerships, explicitly defining and agreeing o objectives before initiating collaborative processes. He urged stakeholders to prioritize value driven collaboration over superficial engagement.

The panel discussion reinforced bioeconomy transformation requires a combination of scientific research, entrepreneurship, strong policy frameworks, and meaningful and effective partnerships with a focus on scalability, sustainability, and inclusion.

Panel 2: Bioeconomy Partnerships

Chair Dr. Elspeth MacRae, IACGB

The chair explained that the IACGB has been engaging with various bioeconomy networks and platforms to foster collaboration, share perspectives, and align visions of the bioeconomy. In the session a number of bioeconomy networks and initiatives presented their aim, scope and key activities. This included presentations of

- The European Space Agency (ESA) Space Solutions
- The European Bioeconomy University Alliance
- World Economic Forum (WEF) Bioeconomy Initiative
- FAO Bioeconomy Strategic priority programme on the Bioeconomy
- The Latin American Bioeconomy Network
- The International Bioeconomy Forum (IBF)
- The Global Bioeconomy Alliance

The chair Dr MacRae emphasized the importance of creating opportunities to bring everyone together to share and collaborate on the many emerging initiatives in the bioeconomy and expressed hope for organizing such a gathering in the coming year to foster a collective

Farewell and Closing of the Global Bioeconomy Summit 2024

Co-Chairs: Prof Christine Lang, Dr Elspeth MacRae, & Dr Julius Ecuru, Co-Chairs, IACGB

Prof. Christine Lange, Chair of IACGB, described the Global Bioeconomy Summit 2024 as highly successful, emphasizing the valuable exchange of experiences, global bioeconomy insights, and strengthened collaborations. She highlighted the urgency of accelerating bioeconomy actions, celebrated the emergence of a global bioeconomy partnership, and announced that Ireland will host GBS 2026, continuing the summit's legacy of advancing bioeconomy discussions worldwide. She also expressed her deep gratitude to Dr. Julius Ecuru for his leadership, the IACGB members for their dedication, donors and sponsors for their support, and all speakers, panellists, moderators, and attendees whose contributions, enthusiasm, and collaboration were instrumental in making GBS 2024 a great success.

Patrick Barrett announced Ireland's honor in hosting **GBS 2026,** emphasizing its commitment to **climate action, sustainable food systems, rural development, and innovation,** while co-designing the summit with global stakeholders to integrate local and global efforts reinforcing the role of **youth and evidence-based action in shaping the bioeconomy's future**

Dr. Julius Ecuru, BioInnovateAfrica and Co-chair of IACGB, closed the GBS2024 Summit and celebrated GBS 2024 as a historic milestone, marking the first summit in Africa with broad global participation and significant momentum for advancing the African bioeconomy. He expressed gratitude to participants, sponsors, IACGB, Youth Champions, exhibitors, and his BioInnovate Africa team, congratulated Ireland on hosting GBS 2026, and urged continued collaboration and knowledge-sharing to shape a sustainable global bioeconomy.

Summaries of Workshops

Three Thematic Workshop Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy. For full workshop reports, see Section 6 on page 68

Breakout Session I (Day one-Morning Session)

1) An Intergenerational Dialogue: How to Bridge Youth Visions for Bioeconomy with International Policies on Bioeconomy and thought Leaders to Shape a Sustainable Future?

(FAO, World Food Forum, IACGB Youth Champions, EU Bioeconomy Youth Ambassadors)

The workshop focused on fostering intergenerational dialogue to build a sustainable bioeconomy. The event successfully created a collaborative atmosphere, allowing policymakers and youth to bond and share clear visions for joint action. Four key outcomes emerged: 1) bridging gaps in access to education and vocational training tailored to local realities, 2) developing effective international mechanisms to include youth in policymaking from design to implementation,3) ensuring the transition to a sustainable bioeconomy is inclusive and just, and 4) promoting global collaboration to address challenges and enhance synergies. These priorities aim to empower youth and foster collective progress in bioeconomic development

2) Bioeconomy Meets One Health – How to Develop Regional Value Creation Ecosystems Based on Medicinal Plants and Herbs Cultivation

(University of Greifswald)

The workshop highlighted the potential for mutual benefits between these two approaches. A key takeaway was the critical role of knowledge at every stage of the medicinal plant value chain, from cultivation and harvesting to processing, analysis, and marketing. Enhancing knowledge for all stakeholders, including growers and marketers, is essential, alongside efforts to preserve and share traditional knowledge. These efforts must be rooted in trust, equality, mutual benefit, and a commitment to creating local value. This underscores the importance of integrating diverse knowledge systems to advance both the bioeconomy and One Health objectives

3) Exploring Global Collaboration Opportunities for Universities in the Bioeconomy Field

(European Bioeconomy University Alliance (EBU))

The workshop brought together around 50 participants for a lively discussion. A key takeaway was the clear advantage of creating a network among universities to foster collaboration in the bioeconomy field. Participants agreed that this initiative should be advanced to the next level through more structured and detailed discussions. The next step is to organize a formal meeting of the new Bioeconomy University Alliance, with the aim of holding its inaugural session at the GBS 2026. This initiative seeks to strengthen global academic collaboration and innovation in the bioeconomy.

4) Factors Impacting the Implementation of Biorefinery Technologies in the Global Economy

(Department of Science and Innovation, South Africa)

The workshop focused on factors impacting the implementation of biorefinery technology, and featured a diverse panel of experts from Denmark, South Africa, Estonia, and Canada. Key takeaways included the need for open communication on successes and challenges, enhanced international collaboration, and a focus on indigenous communities and youth. Emphasis was placed on optimizing bioresource use, building business cases for community empowerment, de-risking early-stage research, and fostering partnerships to drive sustainability and knowledge sharing.

5) The Power of Many: Addressing Global Food System Challenges Through Innovation in a BioEconomy Context

(Seeding The Future van Lengerich Foundation)

The workshop involving v, CSOs, entrepreneurs, SMEs and startups, focused on addressing challenges in the food system. Key takeaways included the importance of engaging stakeholders across the entire value chain to uncover significant opportunities. There is a pressing need for local governments and policymakers to enable equitable access to safe, nutritious, and affordable food. Additionally, the urgency for long term capital, sincere impact investments, and increased government funding was emphasized to drive sustainable, human-centered sustainable growth. Finally, he highlighted the need for raising global awareness and fostering aggressive investments from international partners.

6) Harnessing Collective Intelligence for Bioventures Solutions in LATAM

(Inter-American Institute for Cooperation on Agriculture (IICA))

The workshop identified that key challenges for bio-entrepreneurship are consistent across Asia, Africa, and Latin America. These include a lack of training, difficulty in applying knowledge to specific contexts, limited access to finance, and challenges in developing partnerships. The discussion also explored how the Global South and North can cooperate for mutual benefit through technology transfer, financial solutions, fair trade, and triangular cooperation. These strategies aim to create win-win solutions that address shared challenges and foster sustainable growth in the bioeconomy.

7) Financing the Bioeconomy: African Opportunities and Challenges

(World Bioeconomy Forum/ NatureFinance/ Ecosystems Finance Health)

The workshop on financing the bioeconomy highlighted its massive market potential and the critical need for sustainability, as our economy and existence depend on nature. The discussion noted a dynamic between the Global North, focusing on the circular economy and clean energy, and the Global South, viewing the bioeconomy as a tool for immediate development. Emerging channels for financing were identified, though not elaborated in detail. The session also emphasized the importance of practical implementation, with South Africa taking a leading role in developing standards and metrics aligned with the G20 high-level principles. This collaborative effort aims to bridge regional perspectives and ensure sustainable and impactful bioeconomic growth.

8) Making it real – Exploring Concrete Actions and Recommendations Towards Fostering the Implementation of the African Union (AU) – European Union (EU) Innovation Agenda through Bio-Economy Collaboration

(BioInnovation Institute Foundation (BII) BioInnovate Africa and GrowthAfrica Foundation)

The workshop envisioned addressed the disconnect between the Global North and South. Participants emphasized the need to move frameworks from macro and meso levels to practical micro-level applications. The discussion focused on how bioeconomy SMEs can collaborate effectively with local and global partners, guided by real-world examples. Since March, efforts have been underway with BioInnovate and Growth Africa to explore solutions. Four key themes emerged: partnerships, implementation, localization, and financing, which are essential for fostering collaboration and ensuring impactful outcomes. The event highlighted actionable steps to bridge silos and drive progress in global biotech initiatives.

Breakout Session II (Day one-afternoon)

9) AI-Powered Solutions for Pest and Disease Management in Primary Bioeconomy Production

(International Bioeconomy Forum/ ICT-AGRI ERA-NET)

The workshop addressed the use of artificial intelligence (AI) in pest and disease management within primary bioeconomy production. The widespread availability of AI enables innovative solutions by integrating data from various sources, providing timely and impactful advice for farmers. This has fostered a new ecosystem of entrepreneurs, often led by young women, highlighting significant progress in the field. However, advancing to automated pest and disease recognition requires extensive training of AI models, a complex and time-intensive process. Efforts should also focus on adding value across the entire chain to enhance cost-effectiveness. Participants identified solutions for specific use cases, and new collaborations are being developed between Kenya and Colombia to further these innovations

10) The Significance of Water in Bioeconomy Strategies

(Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB)

The workshop examined the critical role of water in bioeconomic strategies from urban, rural, and industrial perspectives. A key finding was the significant regional variation in water resources across Africa, requiring water management to be approached regionally, as water transcends national borders. Participants identified challenges, highlighted successful practices, and outlined requirements for integrating water management into bioeconomic strategies. Emphasis was placed on the importance of addressing water issues to unlock the full potential of the bioeconomy. Additionally, the water-energy-food nexus was recognized as central to ensuring sustainable and effective utilization of water resources in implementing these strategies.

11) Sustainable Bioenergy-Biochar Systems and Circular Bioeconomy

(CIFOR-ICRAF, University of Manchester)

The workshop discussed sustainability ,knowledge sharing and co learning in bioenergy and biochar systems. The event brought together experts from research and development organizations. Participants identified four key pillars for sustainable biochar and bioenergy systems: sustainable production and processing, capacity development through training and awareness, commercialization, and standardization. These pillars form the foundation for advancing a sustainable and circular bioeconomy in this field.

12) Availability of and Competition for Biomass in the Bioeconomy

(icipe/ University of Bonn)

The workshop examined the availability and competing uses of biomass in the bioeconomy focusing on supply and demand dynamics, with eight case studies from the Global South highlighting key challenges. A major takeaway was the critical lack of data on biomass usage, including its location, size, and competing applications. The limited case studies available cannot be generalized, underscoring the need for more comprehensive research. The participants emphasized the importance of coordinated efforts and strategic planning among stakeholders to address these gaps effectively.

13) Healthy Soils: An essential Prerequisite for Sustainable Bioeconomy

(Eco-Environment Innovation/ Art and Nature Foundation Nantesbuch)

The workshop emphasized the critical role of healthy soils for sustainable bioresource provision. Advances in microbiome research on soils and human interaction, e.g. through food consumption, can foster societal awareness of soil health and open new bioeconomic opportunities. Agroforestry, including mixed cropping systems, was highlighted as vital for protecting soil functions and addressing climate mitigation and adaptation. The participants underscored the interconnectedness of above-ground and below-ground biodiversity, essential for sustainable biomass production and ecosystem functions. In conclusion, healthy soils are indispensable for humanity's survival

14 Let's Create a Future-Ready bioeconomy: Innovative, Inclusive and Sustainable!

(EU Bioeconomy Youth Ambassadors)

The EU Bioeconomy Youth Ambassadors invited diverse teams to develop entrepreneurial and sustainable ideas for bioeconomy development. Participants were divided into 10 diverse teams, ensuring a mix of gender and geographical representation, and assigned different bioeconomy sectors such as fisheries, aquaculture, regenerative agriculture, and food system, The Teams tackled four key challenges, showcasing innovation and creativity across the board. Ultimately, a winning team focusing on bio-based agriculture was selected due to their passion, inclusive business approach and potential impact of their concept idea, which aligned strongly with bioeconomy sustainability principles.

15) Private-Public Cooperation in the Bioeconomy as a Driver for (re)-Industrialisation

(Bio-based Industries Consortium (BIC))

This workshop explored the role of public-private collaboration in the bioeconomy. Public- Private collaboration in the bioeconomy has gained momentum globally. At the workshop six models of public-private collaboration were presented showcasing their roles as a driver of reindustrialization.

These models provided actionable frameworks for addressing the key challenges of collaboration, particularly in the Global South. The workshop breakout groups focused on adressing the "three Fs"—focus, format, and funding of the collaboration. Participants agreed that developing standardized blueprints for partnerships at regional, national, and global levels is essential to scale bioeconomy initiatives effectively. Follow-up activities will focus on further elaboration on globally recognized blueprints for private-public bioeconomy cooperation that can provides strategic pathways for fostering industrial transformation and economic growth through bio-based solutions

16) The Contribution of Forest Products to the Sustainable Bioeconomy in Africa - Trends, Challenges and Opportunities

(Food and Agriculture Organization (FAO))

The workshop explored contribution of forests and forest products to the sustainable bioeconomy through a multi-stakeholder panel involving international organizations, foundations, and the private sector. Forest-based bioeconomies offer viable pathways for conserving natural resources while supporting livelihoods and driving economic growth. Forest product value chains present promising opportunities to upscale the sustainable forest-based bioeconomy. However, interventions must be safeguarded against potential harms and damages to ensure sustainability and inclusivity. Holistic an enabling policies, including targeted incentives, are essential for facilitating sustainable bioeconomy development. Placing local communities at the center of engagement, with a focus on gender inclusivity, youth involvement, and creating viable job opportunities, is crucial for advancing the bioeconomy in the Global South, not lest in Africa.

Breakout Session III (Day two-Morning)

17) Connecting Young Changemakers and Thought Leaders to Shape a Sustainable Future

IACGB Bioeconomy Youth Champions

The workshop brought together global youth organizations in bioeconomy-related fields like biodiversity, synthetic biology, and biosecurity. A key outcome was the need for broader participation, as many organizations couldn't attend in person in Nairobi. To address this, a virtual follow-up fora will be organized, providing a platform for deeper collaboration of young changemakers. The initiative aims to connect youth groups globally to collectively tackle future challenges and shape a sustainable bioeconomy.

18) Leveraging the Nexus of Biodiversity Informatics and Bioeconomy to Improve Rural and Urban Livelihoods

(The International Centre of Insect Physiology and Ecology, icipe)

The workshop addressed the integration of biodiversity informatics in the bioeconomy, with a focus on agrobiodiversity, regenerative agriculture, and indigenous knowledge. The panel included multidisciplinary experts from the Global South and Africa, representing fields such as bioresource management, environmental science, conservation biology, and climate finance, along with a passionate youth representative. A key takeaway was the scarcity and variability of biodiversity databases in the African context, which are critical for sustainable bioeconomic transformation. The integration of indigenous knowledge with scientific evidence was highlighted as essential to driving community action. Capacity building for indigenous communities and national stakeholders in biodiversity informatics and the bioeconomy was prioritized. Lastly, the workshop stressed the importance of enhancing investment through public-private partnerships, collaboration, and market linkages.

19) Metrics and Technical Standards to Monitor the Economic Contribution and Sustainability of the Bioeconomy and Foster Innovation

(United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC,Food and Agriculture Organization (FAO), the Stockholm Environment Institute (SEI), theEngineering Biology Research Consortium (EBRC), Imperial College London)

The workshop elaborated on the importance of establishing robust measurement frameworks and technical standards for advancing a sustainable and inclusive bioeconomy. Three levels of measurement and standards were discussed, highlighting the limitations of current national accounting frameworks in capturing environmental impacts and welfare considerations. He stressed the need for transparent data sources and monitoring mechanisms to enable meaningful comparisons across national, regional, and local levels. Of key importance are technical standards in fostering advancements in bioengineering, biology, and innovative biotechnologies, particularly for assessing sustainability and sustainable biomass feedstocks. Participants called for integrating economic, social, and environmental approaches to drive the bioeconomy while aligning with the G20 principles. Participants also proposed mapping existing measurement initiatives to support global and local bioeconomy goals effectively.

20) Feedstocks for New Value Chains, Unlocking Full Potential of Crop Residues and Food Processing Side-Streams

(LL-BioEconomy, Research & Advisory, Beamcircular, Danish Technological Institute)

The workshop highlighted the urgency of positioning the bioeconomy as a solution to global challenges, including climate change, gender equity, biodiversity, and food security. Five eminent speakers from five continents emphasized the importance of unlocking the full potential of side streams and residues while creating jobs, supporting rural livelihoods, and reducing the export of raw materials. The discussion underscored the need for an international bioeconomy partnership focused on young researchers, knowledge sharing, and technology transfer, particularly in the Global South. A key goal is to enhance the use of resources through collaboration across continents. To facilitate this, participants proposed the launch of an international knowledge-sharing platform, which would serve as a repository for best practices, technical expertise, and policy insights.

21) Will Small-Scale African farmers be Active Participants in the Worldwide Circular Bio-Economy by 2044

(The EU DIVAGRI Project)

The workshop discussed the importance of empowering small-scale African farmers to actively participate in the global circular bioeconomy by 2044. It was concluded that researchers must engage with farmers to address food security challenges effectively. Participatory action research methodologies and needs-based analyses should be prioritized to align agricultural research with community needs. Farmers were encouraged to research market demand before committing resources to new ventures and to explore innovative ways to access the market and diversify adn add value to their products. Collaboration between farmers, researchers, and extension officers was identified as essential for enhancing productivity and fostering bioeconomy growth. Clear and effective communication was also noted as critical for ensuring the success of these initiatives.

22) Building Sustainable and Inclusive Forest-Based Bioeconomy Value Chains and Business Models Globally

(International Bioeconomy Forum (IBF), Working Group on Forestry)

The workshop examined five case studies from countries across four continents. The studies highlighted social inclusivity, with active involvement of women and Indigenous communities, and identified opportunities for scaling up bioeconomy initiatives. A key finding was the need for bioeconomy business models to prioritize environmental sustainability, circularity, and economic viability. Improved data collection emerged as a critical requirement for influencing policymakers and securing financing for scaling efforts. Participants highlighted that comprehensive and reliable data on forest resources, production processes, and market trends is essential for informed decision-making and investment planning. . Participants also emphasized the role of public stakeholder engagement and stronger collaboration between governments, industry, and local communities to enhance the adoption and impact of forest-based bioeconomy model

23) Ready for Takeoff: Empowering Africa's Workforce for the Bioeconomy

(The Roundtable on Sustainable Biomaterials (RSB))

The workshop focused on how to empower Africa's workforce for the bioeconomy and ensuring a just transition. The discussion emphasized that sustainability is non-negotiable for building a resilient bioeconomy. Upskilling Africa's workforce requires embedding sustainability fluency into education, with a focus on practical rather than theoretical skills. Collaboration between policymakers and academic institutions was identified as vital for aligning workforce development with bioeconomic goals. Additionally, political buy-in was deemed essential to unlock financing and drive bioeconomic development, underscoring the idea that policy often takes precedence over science in ensuring progress. The session concluded with a call to integrate these elements to advance Africa's bioeconomy effectively

24) Regionalisation of Bioeconomy: Nested Approaches from Global Targets to Local Implementation

(Forschungszentrum Juelich, The National Center for Genetic Engineering and Biotechnology (BIOTEC) Thailand, the Inter-American Institute for Cooperation on Agriculture (IICA), the Policy Action Initiative, Kenya, the Stockholm Environment Institute (SEI))

The workshop explored how global bioeconomy strategies can be effectively translated into actionable measures at regional and local levels The workshop emphasized a nested approach, connecting global targets to local implementation. Two quotes captured the discussion: bioeconomy is like a puzzle under construction, requiring collective effort to find and assemble all the pieces, and a reimagining of JF Kennedy's words, urging participants to focus on what bioeconomy can do to transform the future. The key finding was that all levels—macro, meso, and micro—play essential roles. Macro strategies provide a vision and map for the bioeconomy, meso-level efforts focus on facilitating actions like financing and standardization, and micro-level strategies bring implementation to life. The session encouraged ongoing dialogue and sharing of experiences from different levels which would help advancing the bioeconomy, globally, regional and locally.

Full Report of the Plenary Sessions

DAY 1

WEDNESDAY 23 OCTOBER 2024

Official opening and Welcome addresses

Session Chairs:

Prof Christine Lang, Dr Elspeth MacRae, and Dr Julius Ecuru, Co-Chairs, IACGB

Welcome and Introduction by Moderator

Prof. Christine Lang, Co-Chair of the International Advisory Council on Global Bioeconomy (IACGB), Germany, welcomed attendees to the 2024 Global Bioeconomy Summit in Nairobi, marking the first time it is held outside Germany. She highlighted the opportunity to showcase bioeconomy initiatives from different regions, with a special focus on Africa, through plenary sessions, workshops, and exhibitions. Christine Lang emphasized the growing global recognition of the bioeconomy as a sustainable growth pathway, now part of G20 and G7 agendas, and its critical role in addressing pressing challenges like climate change, biodiversity loss, and food insecurity. She expressed gratitude to the hosts, organizers, sponsors, and participants, and encouraged delegates to use the summit as a platform for meaningful discussions, partnerships, and actions for a sustainable future

Speakers

Dr. Abdou Tenkouano Director General, International Centre of Insect Physiology and Ecology (icipe), Kenya welcomed attendees to the 2024 Global Bioeconomy Summit (GBS) in Nairobi, marking the first time the summit is held outside Germany and in Africa. He acknowledged the efforts of various partners, including the International Advisory Council and Bio Innovate Africa, in making the summit possible. Abdou Tenkouano emphasized the significance of the bioeconomy as a sustainable growth pathway, particularly in Africa, where it can help address youth unemployment and climate challenges. He highlighted the East African Community's pioneering bioeconomy strategy and the growing interest from African nations in developing national bioeconomy strategies. The summit, he said, provides an important platform for sharing experiences, learning, and building partnerships to advance bioeconomy development globally. He concluded by stressing the role of innovation, research, and cross-regional collaboration in scaling bioeconomic solutions for societal benefit.

Bettina Stark-Watzinger Minister, German Federal Ministry of Education and Research (video message), Germany emphasized the importance of bio-based materials and biological knowledge during her address to the Global Bioeconomy Summit in Nairobi. She highlighted the potential of agricultural byproducts, such as cassava, cacao, and rice husks, as valuable raw materials for various industries, including construction, chemicals, and cosmetics. The summit serves as a vital international platform for dialogue, idea exchange, and collaboration, leveraging the unique resources and expertise of each country to drive innovation and sustainability. She acknowledged the progress made in bioeconomy initiatives worldwide and commended Kenya for hosting the 4th summit. She also underscored the significance of international cooperation, particularly in areas like advanced breeding technologies, to address global challenges such as climate resilience and sustainability. She concluded by expressing her gratitude to the participants and their efforts to promote a bioeconomy that fosters progress and sustainability globally.

Claudia Mueller, Parliamentary State Secretary, German Federal Ministry of Food and Agriculture, Germany opened the 4th Global Bioeconomy Summit by emphasizing its significance as the first to be held outside Germany, in Nairobi, Kenya. She highlighted Germany's role as a pioneer in bioeconomy, with its first strategy adopted in 2010, and stressed the need for international collaboration to address global challenges like climate change, resource conservation, and food security. Mueller underscored the importance of combining ecology and economy, leveraging innovations at the intersection of biology and technology, and adopting sustainable biomass production and circular economy principles. She reiterated Germany's commitment to prioritizing food security ("Food First") over other biomass uses and promoting efficient resource management. She also acknowledged the momentum of international bioeconomy initiatives, including the recently 10 high level G20 principles on bioeconomy, and announced that the upcoming Global Forum on Food and Agriculture in Berlin will further address these critical issues. Claudia Mueller concluded by encouraging global dialogue and cooperation to advance sustainable bioeconomy strategies.

Ambassador Caroline Vicini, Swedish Ambassador to Kenya, Sweden highlighted Sweden's longstanding support for bioeconomic initiatives in East Africa, emphasizing the importance of adding value to bioresources for sustainability, environmental benefits, and economic growth. She praised the Global Bioeconomy Summit's debut in Africa, co-hosted by key partners such as BioInnovate Africa, Stockholm Environment Institute (SEI), the East African Science and Technology Commission (EASTECO). The ambassador stressed the potential of bioeconomy to drive inclusive growth by creating jobs and fostering collaboration between governments, academia, and private sectors. She specifically noted Sweden's initiatives in sustainable forestry in East Africa, highlighting its environmental and housing benefits. Sweden's ongoing partnerships, including the recent agreement to further bioeconomy development in Kenya, demonstrate a commitment to combining research, innovation, and business to address global challenges like population growth, food security, and sustainability. She concluded with an invitation for increased collaboration and expressed hope for fruitful outcomes from the summit.

Dr. Andrew Mwihia Karanja, Cabinet Secretary, Ministry of Agriculture and Livestock Development, Government of Kenya speaking on behalf of the Kenyan government, welcomed delegates to Nairobi for the 2024 Global Bioeconomy Summit, marking the first time the summit is being hosted outside Germany. He highlighted the growing recognition of the bioeconomy as a sustainable growth pathway globally, particularly in Africa, where it supports food systems, sustainable industries, and climate resilience. He emphasized the role of agriculture, which generates significant biomass in Africa, as a foundation for value addition and sustainable economic growth. Kenya's leadership in developing the East African Community's first regional bioeconomy strategy in 2022 was commended, with priorities including food security, bioenergy, and sustainable industries. Dr. Karanja called for international collaboration to support policy development, innovation, and youth-focused initiatives in the bioeconomy. He concluded by encouraging delegates to explore Kenya's unique offerings and expressed hope for productive deliberations at the summit

Plenary Session I:
Keynotes and Panel – Bioeconomy's Role and Impact in Today's Political, Economic, and Ecological Landscape


Session Chairs: Prof Christine Lang and Dr Julius Ecuru, Co-Chairs, IACGB

Speakers

Dr. Ertharin Cousin, President and CEO, Food Systems for the Future, USA highlighted the critical role of the bioeconomy in addressing global challenges, emphasizing its potential to drive innovation, create jobs, and support environmental sustainability. She stressed the importance of transforming food systems to enhance ecological resilience, promote sustainable markets, and tackle food insecurity, noting that 2.4 billion people face food insecurity, with many suffering from hunger due to conflicts and climate change. Ertharin Cousin called for collective action, breaking silos across sectors, and embracing partnerships between public and private actors to achieve systemic change. She emphasized the need for adequate financing to support bioeconomy initiatives and policy changes that facilitate sustainable growth. Finally, she underscored the importance of imagination and collaboration to build a future of affordable, nutritious food and a thriving bioeconomy, concluding with a poem envisioning a balanced and sustainable future

Prof. Måns Nilsson, Executive Director, Stockholm Environment Institute, Sweden discussed the evolution of the bioeconomy, contrasting its roots in pre-industrial low-tech circular systems with today's need to transition from a fossil-based economy. He highlighted the bioeconomy as a promising novel strategy for sustainable growth, simultaneously addressing global challenges like climate change, biodiversity loss, and food insecurity while providing diverse opportunities for national and regional development. Måns Nilsson emphasized the importance of integrating modern knowledge and technology to create value-added, cross-sectoral applications and stressed the need for context-sensitive approaches in low- and middle-income countries. He advocated for policies that align academia, the private sector, and government, along with investments in innovation platforms, capacity building, and sustainable practices. Additionally, he highlighted the role of public procurement in creating demand for bio-based products and the necessity of engaging rural communities and youth to ensure sustainability and innovation. He concluded by reaffirming SEI's commitment to advancing the bioeconomy through research, partnerships, and strategic initiatives.

Carina Pimenta, National Secretary for the Bioeconomy in the Government of Brazil highlighted Brazil's vision for the bioeconomy, emphasizing its integration with sustainable development, biodiversity conservation and climate action. She underscored the bioeconomy as a paradigm shift for economic and productive sectors, focusing on nature-driven solutions to tackle global challenges like biodiversity loss, climate change, and poverty. She discussed Brazil's leadership in promoting the bioeconomy on international platforms such as the G20, where initiatives addressed bioenergy, biotechnology, and sustainable food systems, while emphasizing the role of traditional and scientific knowledge. Carina Pimenta praised Kenya's efforts in adopting a bioeconomy strategy, reinforcing the need for developing nations to align bioeconomy policies with their unique contexts. Brazil's national bioeconomy strategy, launched in 2023, prioritizes forest economies, sustainable food systems, and the restoration of ecosystems while incorporating social and economic inclusion for indigenous and local communities. She advocated for international cooperation, financing, and policy coherence to advance the bioeconomy globally. Lastly, she emphasized fostering entrepreneurship, green jobs, and innovation as essential steps toward a sustainable, inclusive, and prosperous bioeconomic future.

Panel Session: Bioeconomy's Role Today

Session Chairs: Prof Christine Lang and Dr Julius Ecuru, Co-Chairs, IACGB

The chair, Prof. Christine Lang, acknowledged the participants' extensive experience in system transformation and active involvement in related activities. She invited insights on what key point participants believe is most crucial, in terms of opportunities and challenges in the development of the bioeconomy at this moment. In so doing, the panellists had the opportunity to set the scene for the discussion in the coming two days.

Fortunate Muyambi, Deputy Executive Secretary, East African Science and Technology Commission, Rwanda emphasized the critical need to address biodiversity loss and food insecurity through robust bioeconomy policies and strategies. He highlighted the limited presence of regional and national bioeconomy strategies globally, with examples in East Africa and South Africa, and called for the development of enabling environments to guide implementation. Mr. Muyambi stressed the importance of financing innovation, research, and development to advance bioeconomy initiatives effectively in the region.

Dr. Elspeth MacRae Co-Chair International Advisory Council on Global Bioeconomy, New Zealand outlined four critical points for advancing the bioeconomy. She emphasized (i) the importance of urban redesign, focusing on cities as productive and sustainable environments for food production and carbon capture. (ii) the need for global alignment on measurements and standards, such as planetary boundaries, to foster consensus and effective progress. (iii) the transformation of trade and supply chains as a key area requiring urgent attention, noting that the bioeconomy will significantly reshape global business dynamics. Finally, she cautioned against resistance from established fossil industries, which could slow the adoption of the bioeconomy.

Pekka Pesonen, Permanent Secretary, Ministry of Agriculture and Forestry, Government of Finland stressed the importance of bioeconomy as a pathway to economic prosperity and sustainability, particularly in agriculture and forestry. He highlighted the need to mobilize local farming and forestry communities to actively participate in bioeconomy initiatives, fostering collaboration across industries and value chains. Pekka Pesonen underlined the critical role of engaging young people, noting the challenge of declining youth participation in agriculture and forestry. He advocated for improving the image of these sectors and investing in education to inspire and retain young talent. Finally, he expressed confidence that successful bioeconomy models from Finland could be adapted to East Africa, with proper support and community engagement

Prof. Joachim von Braun, Center for Development Research (ZEF), Bonn University, President, Pontifical Academy of Sciences, IACGB, Germany called the attention to the urgent need to integrate the bioeconomy into global efforts to address critical challenges, particularly the failing progress on Sustainable Development Goals (SDGs), such as eradicating hunger (SDG 2), which is now deemed unachievable by 2030. He highlighted the escalating costs of achieving these goals and proposed rebooting the SDGs, integrating the bioeconomy within them. He pointed to the role of the bioeconomy in enhancing the three pillars of climate resilience, mitigation, adaptation, and systemic transformation. Von Braun also stressed that the potential of the bioeconomy must translate into tangible outcomes. For this to happen he called for a global science and innovation platform to drive implementation. He proposed a consultative group on bioeconomy science and innovation to unify efforts across diverse bioeconomy applications and foster collaboration among nations.

Ana Del Hierro Calvachi, IACGB Youth Champion, Ecuador representing the youth perspective, emphasized the importance of education, skill development, and opportunities for young people in the bioeconomy. She highlighted gaps such as limited access to training, weak connections between academia and industry, and insufficient infrastructure to support innovation and entrepreneurship. While acknowledging successful initiatives like the Marie Curie Actions and BioAfrica. She stressed the need for greater youth involvement in decision-making processes and the development of science-based solutions with social impact. Ana called for more inclusive collaboration across regions, particularly to integrate underrepresented areas like Asia, and encouraged young professionals to join efforts to drive progress in the bioeconomy globally

Building on the panellists' insights and the emphasis on urgent action, the chair asked them to identify what they believed were the most critical actions required.

The view by Prof. Joachim von Braun was that the urgent next step is to build bioeconomy bridges between the Biodiversity, Climate, and Food Systems Summits (COPs). He highlighted this as the only viable approach to aligning these major agendas in a productive way, a strategy that has already been embraced by the Brazilian G20 initiative

Pekka Pesonen stressed the importance making better use of scientific evidence in Europe by incorporating new genomic technologies (NGTs) as a tool in bioeconomy development. He pointed out that Europe has been lagging in this area, as demonstrated by the EU Council of Environment Ministers' slow progress in approving NGTs. He argued that this delay hampers the development of the bioeconomy in Europe but also affects progress in developing countries. Pesonen therefore stressed the need to fully leverage all available technologies to realize the bioeconomy's potential.

Fortunate Muyambi listed three prioritized key actions for bioeconomy development in East Africa. First, the support to bio-entrepreneurship to add value to bio-based products. Secondly, research, development, and technology to enhance value addition to primary products. Third, improving access to finance by developing funds and financing mechanisms for innovators and entrepreneurs. These efforts are essential to fostering bioeconomy growth in the region. To achieve this, the East African Community (EAC) will establish technical working group to deliberate on R&D and technology transfer priorities serving the whole region.

The chair asked Dr. MacRae about the need to develop funding mechanisms for bioeconomy growth and the mindset required to foster innovation. She argued that advancing the bioeconomy requires a significant and rapid shift from current systems to effectively combat climate change and biodiversity loss. Governments and systems actors are heavily invested in conventional technologies, stifling change. She used New Zealand as an example, with a recent development of bioeconomy strategies. The country has a small population and vast land areas, and an economy largely rooted in traditional forestry and agriculture, exporting biobased products to low prices. Taking a new route, she highlighted the potential for more self-sufficiency replacing fossil fuel-based products with biobased products and by adding more value locally. Dr. Elspeth further suggested that countries in Africa and Latin America have an opportunity to move away from outdated supply chains and instead focus on producing value-added products locally. This approach could foster rural development while also reshaping urban environments, making them more connected to rural systems. She stressed that urban design must evolve to align with these changes, posing critical questions about how we will live and produce in the future. She argued that the pace of change is accelerating, and it is vital to stay ahead rather than fall behind.

The chair continued by asking the panellists how to leverage the bioeconomy agenda to drive desired socioeconomic change and how to make the bioeconomy accessible and relevant to people and improving livelihoods. Fortunate Muyambi responded to this question by sharing examples of implementing the bioeconomy in East Africa. The EAC has developed a regional bioeconomy strategy, which now serves as a guiding framework for the creation of national bioeconomy strategies and concrete implementation plans. Progress in the region has been made, reflected in the East African Bioeconomy Status Reports in 2022 and 2024. These reports have helped to raise awareness and highlight opportunities, particularly for investors and entrepreneurs interested in developing innovative bio-based businesses. Mechanisms for information sharing have also been established through regional bioeconomy conferences, national policy dialogues, and a East African Bioeconomy Observatory.

On the topic of relevance and awareness, the chair referenced a survey conducted in Germany some years ago, which asked the public to what extent they understood the term "bioeconomy." The results were disappointing. The chair then posed a question to Prof. von Braun on how the concept of the bioeconomy can be made more familiar and understandable to the public? Prof. von Braun emphasized the complexity of the bioeconomy but noted that the "bioeconomy train has already left the station." He argued that instead of continuing to define the concept, efforts should center on scaling up bioeconomy applications. He highlighted a positive trend where global bioeconomy companies, particularly in the US, Europe, and China, are seeking to

acquire start-up bio-based businesses, and he stressed the importance of expanding this trend globally. To achieve scaling, Prof. von Braun underlined the need for supportive regulatory frameworks, government incentives and venture capital, as these are key drivers of innovation and job creation. He also pointed to groundbreaking scientific advancements, such as the 2024 Nobel Prize-winning work in computational protein design and structure prediction, which are poised to significantly boost bioeconomy development. Prof. Von Braun concluded that building the bioeconomy requires both top-down and bottom-up approaches.

The chair noted that the forestry sector is central in the bioeconomy and asked Pekka Pesonen how the forest bioeconomy is being perceived and scaled up in Finland. Pekka Pesonen agreed on the focus on scaling up the bioeconomy and pointed to that meeting consumer demand is essential for success. As an example, he highlighted how the bioeconomy in Finland provides the market with renewable, bio-based products meeting consumer preferences for sustainable solutions. He specifically mentioned innovative technologies for producing bio-based building materials as alternatives to concrete and steel, significantly reducing greenhouse gas emissions in the construction sector. He noted that this approach is highly appealing to consumers, with market forces likely to play a major role in driving their adoption.

Building on the discussion of market mechanisms, the chair raised the issue of costs of biobased products, using sustainable food production and its associated higher prices as an example, raising a question: will bio-based products generally be more expensive than their fossil fuel-based counterparts? Pekka Pesonen argued that high-quality food will likely come at a higher cost in the future. Regarding bio-based products, he emphasized the importance of utilizing the vast existing bioresource base more efficiently than we do today to keep costs down. He identified logistics as a major bottleneck and stressed that reducing prices for novel bio-based products requires optimizing and cascading the use of large biomass volumes already in use, particularly in sectors like forestry, and fully convert biowaste side streams to useful products.

The chair continued to ask Ana Del Hierro Calvachi on how to disseminate information regarding the potential of the bioeconomy more broadly. She responded by saying that a goal is to help people better understand the bioeconomy. The communiqué by GBS Youth Forum was designed to be reader-friendly, and she believes social media will play a key role in spreading awareness. Collaboration is also vital, as it allows organizations and individuals worldwide to share information and connect with key decision-making forums. However, a significant challenge lies in promoting the benefits of bio-based products, which face competition from often cheaper, conventional fossil fuel-based alternatives. To address this, stronger government incentives for bio-based products are needed.

In wrapping up, the chair asked the panellists to identify one key success factor for advancing bioeconomy development. Elspeth McRae emphasized the importance of creating a level playing field for bio-based solutions, which includes fostering local biomanufacturing and usage. Fortunate Muyambi called for the promotion of an innovation-led bioeconomy, with a strong focus on value addition and scaling up initiatives. Prof. von Braun envisioned the establishment of a Global Bioeconomy Science Platform by the next GBS, enabling worldwide connectivity of bioeconomy-related science through a virtual platform with implementation capacity. Pekka Pesonen highlighted the need to enhance productivity in the bioeconomy, focusing on the need to use the currently utilized resource base more efficiently. Ana Del Hierro Calvachi stressed the importance of inclusivity, particularly through empowering and engaging rural youth, leveraging community knowledge, and promoting broad, active participation in bioeconomy development efforts

The Chair , Christine Lange concluded the discussion by noting that all panellists proposed solutions and ways to address challenges. Julius Ecuru, the session's co-chair, also shared his final remarks, summarizing key takeaways from the morning session. He emphasized: (i) the importance of building bridges between different forums, fostering active engagement, and supporting the creation of a science-based bioeconomy platform; (ii) the need to incorporate traditional knowledge and address the social dimensions of the bioeconomy. (iii) the youth perspective and the importance of education and skills development to make young people competitive, entrepreneurial, and capable of building successful businesses and making fields like forestry, agriculture, and bio-based production more attractive and finally (iv) to effectively communicate the benefits of the bioeconomy to the public.

Plenary Session II:

Keynotes and Panel – The Innovation Ecosystem for Bioeconomy - Finance, Technologies and Societal Initiatives

Session Chairs: Dr Mary Maxon and Prof Ian O'Hara, IACGB

Speakers

Morton Engard Rasmussen, Executive Vice President, People and Stakeholder Relations, Novonesis, Denmark talked about the transformative potential of bio solutions in addressing global challenges such as climate change, food security, and sustainable development. Representing Novanesis, a leading Danish bio solutions company, he highlighted innovations such as reducing food waste, creating sustainable proteins, and developing enzymes for low-carbon bioethanol and bioenergy production. Morten Rasmussen stressed the urgency of scaling existing bio solutions and aligning policies to accelerate the transition to a bioeconomy. He called for increased investments in clean technologies, the removal of regulatory barriers, and the redirection of subsidies toward sustainable solutions. He also highlighted the need to engage young talent and foster innovative ecosystems through partnerships between governments, businesses, and academia. He urged stakeholders to collaborate globally, citing successful initiatives like the G20 Bio Economy Initiative and Denmark's Alliance for Bio Solutions. He concluded with a commitment to expanding Novanesis' presence in Africa and promoting bio solutions for a sustainable future.

Dr. Kelly Seagraves, Senior Advisor, Biotechnology Policy, US Department of State, Office of the Special Envoy for Critical and Emerging Technology, USA outlined the U.S. government's comprehensive approach to advancing the bioeconomy through policies, infrastructure, and public-private partnerships. She highlighted the 2022 Executive Order on bioeconomy, which focuses on expanding biomanufacturing capacity, improving data access, and fostering a skilled workforce. Key initiatives include the establishment of the National Bio Economy Board to coordinate efforts across 12 agencies and investments in bio foundries, regional biomass hubs, and pilot-scale testing facilities to de-risk research and scale innovations. Kelly Seagraves emphasized bipartisan legislative support and showcased programs like the USDA's BioPreferred program, which helps commercialize bio-based products through federal procurement incentives. She also noted the Department of Energy and Department of Defense's roles in funding biomanufacturing infrastructure, supporting small companies, and driving innovation in areas like biofuels and bioplastics. Finally, she encouraged global collaboration, emphasizing the importance of partnerships between governments, industry, and academia to accelerate progress and scale sustainable bioeconomic solutions worldwide.

Dr. Linda Davis, Founder and Director of Giraffe Bioenergy in Kenya, shared her journey and vision for building a bioeconomy centered around ethanol cooking fuel. Drawing on her background in microbiology and biotechnology, Linda Davis returned to Kenya after two decades abroad to address the health, environmental, and economic challenges posed by charcoal and firewood cooking. Giraffe Bioenergy focuses on large-scale cassava farming as a feedstock for ethanol, emphasizing food security, rural development, and women's empowerment in semi-arid, underutilized lands. She highlighted significant challenges, including poor infrastructure, limited education in rural areas, and difficulties in raising funding for local bioeconomy initiatives despite evident demand and political support. The company employs innovative cassava propagation and regenerative agricultural practices, creating jobs and improving livelihoods for local communities. Linda Davis called for blended financing, public-private partnerships, and integrated policy support to enable the bioeconomy to thrive. With a goal to establish a $20 million cassava-to-ethanol biorefinery by 2026, she stressed the need for systemic approaches to bioeconomy policies and infrastructure. She concluded with a video showcasing the transformative impact of Giraffe Bioenergy's work on health, environment, and community development in Kilifi County.

Franck Leroy, President of Grand Est, France (video message) highlighted Nairobi's pivotal role as a hub for advancing bioeconomy solutions. The summit aims to promote a vision of sustainable bioeconomy development through global and local collaboration. He emphasized the need for bioeconomy strategies to address pressing global challenges such as protecting natural resources, restoring biodiversity, and fostering sustainable economic solutions, especially in light of the pandemic's impact. The region he represents, located near Paris and Strasbourg, serves as a model for bioeconomy innovation with a strong research ecosystem, competitive industries, and dynamic startups. Key initiatives include advanced biorefineries, bio-based materials, and clean energy solutions, which are integral to transitioning systems toward sustainability and economic resilience. Partnerships with the private sector, focusing on decarbonization and agri-food production, are essential to these efforts. F ranck also underlined Africa's, particularly Kenya's, significant potential in bioeconomy development and the importance of global collaboration to create sustainable solutions. The summit marks a critical step toward constructing a global bioeconomy to address shared challenges and ensure a sustainable future for the planet.

Panel: **Innovation in Bioeconomy Technologies and Finance**

Session Chairs: Dr Mary Maxon and Prof Ian O'Hara, IACGB

Panel discussions

The chair Dr Mary Maxon asked all panellist to provide Panel introductory talks

Nicolo Jokomutzi Moore, Executive Director of Circular Bio-based Europe (CBE), highlighted the organization's efforts to foster a competitive bioeconomy for a sustainable future. CBE is a European partnership between the European Commission and the Bio-based Industries Consortium, jointly funding projects with equal financial contributions. Since its inception, CBE and its predecessor have funded nearly 200 projects with €1.1 billion of EU funding, leveraging approximately €3 billion in private and other investments. The focus is on scaling technologies to market, with initiatives ranging from pilot projects to flagship biorefineries. Over 15 flagship biorefineries and 100 demonstration plants across Europe are working on diverse applications, including bio-based chemicals, textiles, plant proteins, and microalgae, utilizing various biomass sources like agricultural, forestry, and aquatic materials. An example cited was the "After Biochem" project in Northern France, which uses sugar beet residues to produce organic acids for applications like cosmetics and food, reducing emissions by 80% compared to traditional methods. The project also produces clean water and bio-based fertilizers as byproducts. Moore emphasized the importance of public-private partnerships in attracting private capital, showcasing the bioeconomy's potential to drive innovation and sustainability.

Dr. Lily Eurwilaichitr, Assistant Executive Director, National Energy Technology Centre, National Science and Technology Development Agency, Thailand highlighted Thailand's Bio-Circular-Green (BCG) Economy policy, a national initiative launched in 2021 to achieve carbon neutrality by 2050 and net-zero emissions by 2065. The policy integrates bioeconomy, circular economy, and green economy principles, leveraging Thailand's rich biological and cultural diversity through science, technology, and innovation to drive sectors like food, energy, healthcare, and tourism. Lily Eurwilaichitr, emphasized the role of microbial biodiversity as a cornerstone of Thailand's bioeconomy, supported by the Thailand Bio Resource Research Center, which facilitates access to microbial resources and advanced facilities for biofuel, biorefinery, green processing, and specialized enzyme production. She noted the critical importance of microbial enzymes for industrial applications in the country. Additionally, Thailand's participation in ASEAN positions it within a biodiversity hotspot, with the region leveraging collaborative networks like the ASEAN Network on Microbial Utilization (AN Micro) and ASEAN BCG Network. These initiatives build capacity, promote microbial resource management, and enhance bioeconomy development through training and partnerships. Dr. Lily emphasized that ASEAN's efforts could serve as a model for global bioeconomy collaboration

Mandla Nkomo, Chief Executive Director, Partners in Food Solutions, Zimbabwe, emphasized the critical role of food systems within the bioeconomy. He highlighted food processors as central to transforming bioresources into nutritious food while addressing food loss, waste, and energy demands. Expanding dietary diversity beyond staple crops like wheat and maize is vital, and he called for strategies to integrate underutilized crops into people's diets. Mandla Nkomo stressed the importance of addressing hunger and malnutrition in Africa, where a third of the population faces food insecurity, while leveraging bioeconomy innovations to improve rural-urban connectivity as the continent rapidly urbanizes. He advocated for creating hyperlocal bioeconomy ecosystems that prioritize community benefits and tap into indigenous knowledge systems. He also underscored the need to bridge the gap between scientific research and practical application by connecting global expertise with local stakeholders. Facilitating these collaborations and fostering innovation ecosystems are key to driving a bioeconomy transition that addresses pressing societal challenges.

Zhengzheng Qu, Program Manager at the UN Environment Program, discussed mobilizing finance for nature and climate-positive outcomes. Based on the 2023 State of Finance for Nature report, approximately $200 billion has been invested globally in nature-positive initiatives, but this amount needs to quadruple by 2050 to meet climate, nature, and pollution targets. The UN supports governments by developing national strategies, sustainable budgeting tools, and frameworks for repurposing harmful subsidies into renewable energy, which can maintain energy security, create jobs, and yield environmental benefits. The key challenge is redirecting harmful investments, such as the $7 trillion going into environmentally damaging subsidies in agriculture, energy and fisheries, to nature-positive projects. The majority of current funding comes from public sources, highlighting the critical role for private sector involvement and Zhengzheng Qu saw a big role for private sectors to increase their investments. Private sector investment faces barriers like political, market, and supply chain risks, requiring regulatory frameworks, incentives, and concessional finance to mitigate these challenges. The UN is focused on building project pipelines in developing countries, helping local startups in restoration and bioeconomy sectors to scale their operations and attract investment. She concluded by stressing that a collaborative approach between public and private sectors is essential for unlocking the financial resources needed to advance sustainable bioeconomy development globally.

Hayley Ciantar, an EU Bioeconomy Youth Ambassador from Malta, represents one of 15 ambassadors dedicated to bridging the gap between youth and the European Commission on bioeconomy policies. She has spearheaded initiatives like the Bio Economy Matters podcast, the first of its kind globally, showcasing bioeconomy applications across industries and everyday life. Hayley also contributed to the Bioeconomy Youth Vision, which emphasizes youth involvement, bioeconomy education, responsible use of resources, and assessing bioeconomy impacts globally. Acknowledging, the underrepresentation of youth in European decision-making, Hayley advocated for increased mentoring, networking, and financial support to empower young leaders. Her efforts include translating a children's book on bioeconomy into Maltese to enhance accessibility. Beyond her ambassadorial role, she is a law graduate with international academic experience and a young farmer specializing in olive oil production.

Following up on the panellists' introductory talks, the chair Mary Maxon started by asking Lily. Eurwilaichitr: How can biotechnology serve as a capacity builder for local and regional communities and support the adoption of a bioeconomy? She responded that biotechnology is vital for building regional and local bieconomy capacity, but its success hinges on effective management of biological resources and equitable benefit-sharing. The ASEAN Microbial Database (Ambibase) exemplifies this by harmonizing microbial collections across 16 institutes, creating a systematic framework to support bioeconomy and biotechnology applications. Proper management and access-sharing systems are critical foundations for sustainable bioeconomy development

The chair the turned to Nicolo Jokomutzi Moore asking him what the biggest challenges EU and EU companies are facing in scaling up technologies into the market? He underscored three major EU challenges in scaling up bioeconomy technologies. First, financing remains insufficient despite significant investments, leaving many excellent projects unfunded and highlighting the need for alliances with financial institutions. Second, the current regulatory framework is not fit for purpose, as innovative bio-based products often don't align with traditional categories, necessitating adaptations to drive market uptake. Lastly, the narrative around the bioeconomy needs improvement to reduce perceptions of risk among decision-makers, financiers, and the public, with public funding playing a critical role in building trust. Building on the discussion of barriers, the chair asked. Zhengzheng Qu for her perspective on the main obstacles and key success factors for attracting private capital investment in the bioeconomy. She replied that barriers to private capital investment in the bioeconomy include high risk, regulatory challenges, and the lack of mature markets, necessitating public and concessional finance to de-risk investments and attract private funding. Establishing funds for bioeconomy projects is time-consuming and costly, requiring tools like reimbursable grants and guarantees to support fund managers and investors. She also underscored another critical challenge, the lack of bankable bioeconomy projects, prompting efforts like business incubation programs to support startups and local enterprises in sectors such as agriculture, food, and water purification. Bridging the gap between investors and small businesses remains vital, with a focus on scaling these enterprises to align with investment fund requirements and stimulate financial flows in the bioeconomy.

The chair expanded on Mandla Nkomo's insights, highlighting that while some areas of the food system are receiving investments, bioeconomy investments in this sector remain slow. The chair then invited Nkomo to elaborate on the reasons behind this lag. According to Mlandla Nkomo 's the low level of bioeconomy investments in the food system is due to a mismatch between investments that investors are willing to make and the investment where the need is actually greatest. Often, investments focus on high-visibility projects rather than impactful solutions, leaving critical areas underfunded. Challenges include securing financing for food processors to procure raw materials and invest in innovative equipment critical for advancing the bioeconomy. Bridging these gaps with targeted, fit-for-purpose financing solutions could empower small-scale projects to scale up significantly, benefiting farmers

and ensuring the delivery of high-quality products to markets.

The chair the turned to Haley Ciantar on what steps can be taken to make sure that the job opportunities in the bio economy that we know are needed can happen? Her reply was that four key steps to enhance job opportunities in the bioeconomy for recent graduates. First, education systems should integrate bioeconomy topics into existing degree programs, such as bio-based textiles in fashion or bioeconomy law in legal studies. Secondly, partnerships between universities and industries can create job pipelines to facilitate entry into bioeconomy sectors. Third, accessible entry-level employment opportunities with competitive compensation are crucial to attract and retain talent. Finally, supporting youth entrepreneurship through grants, seed funding, and mentorship can empower young entrepreneurs to succeed in the bioeconomy sector.

The Co-chair. Prof. Ian o Hara concluded the session by highlighting its comprehensive exploration of the bioeconomy, with a focus on innovation. Key topics included microbial diversity, gender equality, circular food systems, and the bioeconomy's potential benefits for health and education. He described the bioeconomy as both the economy of today and the future, acknowledging its broad and complex nature. The session showcased major flagship projects in the EU, US, and Asia and emphasized the importance of strong policies to drive the bioeconomy forward. While substantial financial resources are available, the challenge lies in accessing and directing them toward impactful, nature-positive investments. Ian O'Hara stressed the need to advance the maturity of bioeconomy solutions, reduce investment risks, and create an environment conducive to scaling these solutions to market.

DAY 2

THURSDAY 24 OCTOBER 2024

Opening Addresses: Welcome and Introduction to Day 2

Chairs:

Prof Lucia Pittaluga and
Ben Durham, IACGB

Speakers

Dr. Eliane Ubalijoro, CEO of CIFOR-ICRAF, emphasized the transformative potential of the bioeconomy in addressing Africa's critical challenges, including food security, climate resilience, and sustainable development. She highlighted agroforestry and forest-based bioeconomy solutions as pivotal for tackling biodiversity loss, reducing reliance on synthetic inputs, and creating resilient agricultural landscapes. Eliane Ubalijoro stressed the importance of integrating indigenous tree species, sustainable forest management, and community-driven carbon markets to prevent deforestation and diversify revenue streams for smallholder farmers. She advocated for unlocking private and public investments, leveraging debt-for-climate and nature swaps, and applying circular bioeconomy principles to minimize waste and emissions while enhancing resource recovery. CIFOR-ICRAF's efforts include innovations in bioenergy and biochar systems, as well as sustainability assessments to support green and just transitions, particularly in Africa, where youth will soon dominate the global workforce. She concluded by emphasizing the urgency and potential of collaborative action to reshape economies, conserve biodiversity, and build a sustainable future for Africa and the world

Margrethe Vestager, Executive Vice President for Biotech and Biomanufacturing of the European Commission, highlighted the critical role of bioeconomy in addressing global challenges such as climate change, biodiversity loss, and resource depletion. She emphasized that biotechnology and biomanufacturing can revolutionize industries, offering sustainable alternatives to fossil materials, combating hunger, and advancing medical breakthroughs. Margrethe Vestager noted Europe's commitment to advancing the bioeconomy through updated strategies, the upcoming EU Biotech Act, and efforts to harmonize regulations, protect intellectual property, and enhance funding for biotech innovations. She highlighted Europe's bioeconomy as a major economic sector, employing 17 million people and generating over €700 billion annually, with potential global growth sevenfold by 2050. Collaboration was emphasized, with initiatives like the Desira partnership supporting innovation in Africa, Asia, and Latin America, and the upcoming G20 bioeconomy initiative. Her message called for collective action across sectors to leverage the bioeconomy as a global solution to pressing challenges.

Michael Kellner, Deputy Minister of Germany's Federal Ministry of Economic Affairs and Climate Action, emphasized the pivotal role of bioeconomy in advancing the green transition and achieving climate and sustainability targets by 2030. He highlighted the potential of industrial bioeconomy to enhance competitiveness while supporting climate neutrality through bio-based products and processes. To realize this potential, he stressed the need for efficient approval procedures, increased funding for long development cycles, and ensuring sustainable raw material supplies. Michael Kellner underscored the importance of addressing conflicts between environmental protection and industrial resource use while fostering public acceptance. He pointed to global initiatives like the EU Biotech Act (planned for 2025), the G20 Bioeconomic Initiative, and the World Economic Forum's recent report, which demonstrate growing international collaboration. He noted that the Global Bioeconomy Summit serves as a vital platform for fostering cross-border cooperation and aligning global strategies to maximize the bioeconomy's potential for sustainable growth.

Plenary Session III

Bioeconomy, a Pathway for Strengthening Agri-food Systems Resilience and Climate Action in Africa and the Global South Session

Chairs: Prof Lucia Pittaluga and Ben Durham, IACGB

Speakers

Dr. Getachew Tadesse, Director of Operational Analysis at Academia 2063, discussed making the bioeconomy a key policy agenda in Africa. He highlighted its potential to address development challenges, including climate change, food security, poverty reduction, and job creation, particularly for Africa's youth. The main policy challenges include convincing policymakers to embrace the bioeconomy as an integral concept and mainstreaming it into existing development frameworks. Evidence gaps on its feasibility and scalability remain a major hurdle. Dr. Tadesse emphasized the bioeconomy's role in climate resilience, sustainable agriculture, and nutrition, including innovations like insect-based foods to combat malnutrition. He pointed to opportunities like the African Continental Free Trade Agreement and existing frameworks like Agenda 2063, which implicitly support bioeconomy initiatives. Finally, he proposed actionable recommendations, including generating robust data, learning from country experiences, aligning with existing strategies, revisiting trade policies, leveraging climate funds, and promoting public-private partnerships.

Dr. Julio Berdegué Sacristán, Minister of Agriculture and Rural Development, Government of Mexico (video message) emphasized the importance of the bioeconomy in advancing sustainable agriculture, decarbonizing the economy, and creating better-paying rural jobs to eradicate extreme poverty by 2030. Under the leadership of President Claudia Sheinbaum, Mexico has prioritized the bioeconomy as part of its industrial policy, leveraging its agricultural biomass potential and fostering private sector investment, particularly for SMEs. The national bioeconomy strategy, initiated under the previous administration, remains in place with objectives to add value to biomass, stimulate private investment, advance research and innovation, and strengthen governance. Key tasks include mapping biomass availability and supporting SMEs in biofertilizers and bioinputs, and streamlining regulations to encourage investment and strengthen international collaborations to share and gain expertise globally. The creation of a new Ministry of Science underscores Mexico's commitment to advancing science, technology, and sustainable agriculture. Mexico is giving top priority to improving the legal and regulatory environment for bioeconomy development, which in many areas is either missing or is out of date.

Panel 1: Bioeconomy Policy Priorities for Equitable Global Development

Chair Ben Durham, IACGB

Introduction to the Panel discussions

The chair, Ben Durham introduced the session stressing that the economy in Africa is based largely on agriculture and agroprocessed goods and we already have the bioeconomy, it's been around for a long time. His question to the panellists was: is in the new thinking of bioeconomy, what needs to change, why and how?

Dr. Jean Jacques Muhinda, Alliance for a Green Revolution in Africa (AGRA), Kenya stressed that the critical role of the bioeconomy in addressing the challenges posed by climate change, food systems, and environmental sustainability in Africa. He noted that food production in Africa heavily relies on unsustainable land expansion, which must shift toward sustainable intensification practices to protect the environment. Learning from global mistakes, Africa should adopt nature-based solutions like agroecology and regenerative agriculture, which require incentives for farmers and robust policy support. Institutional innovations and evidence-based advocacy are essential to demonstrate the economic, social, and environmental benefits of scaling sustainable practices. Furthermore, mainstreaming bioeconomy initiatives into national planning and investment frameworks, such as CAADP, is crucial for securing government prioritization and resource allocation. He stressed that without integration into national strategies, bioeconomy initiatives risk remaining unfunded and unimplemented.

Dr. Peggy Oti-Boateng, Executive Director of the African Academy of Sciences, Ghana emphasized the need to accelerate Africa's research and innovation agenda to achieve the aspirations of Agenda 2063. She highlighted the importance of investing in science, technology, and innovation (STI) to build research infrastructure, enhance technical competencies, and create an ecosystem that moves innovations from lab to market. Peggy Oti-Boateng noted that Africa must harness its vast ocean resources as part of its bioeconomy and called for equitable partnerships that recognize and integrate African knowledge into global research. She stressed the necessity of investment from African governments and donors, alongside frameworks for collaboration to ensure sustainable STI growth. The African Academy of Sciences aims to be a voice for science in Africa, fostering world-class researchers and promoting indigenous knowledge systems. By working collectively, Africa can create an enabling environment for STI and accelerate its bioeconomy ambitions.

Peter Minang Africa Director, Africa Director, Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), Kenya emphasized the importance of engaging ministries of finance and industrial development in bioeconomy dialogues to secure government investment. Africa's current bioeconomy heavily relies on exporting raw materials like cashew nuts, coffee, and oil palm, with limited value addition or processing. This leads to significant wastage of biomass, which could otherwise be used for nutrition, biofuel, or other value-added products. For example, Africa supplies 60% of the world's cashew nuts, yet only 10% of the cashew fruit is utilized, while the remaining 90% is left unused or unprocessed, despite its significant potential for diverse and economically valuable applications.. Peter Minang argued that advancing the bioeconomy in Africa requires data-driven business cases to convince governments, increase investment in processing technologies, and scaling up small and medium enterprises. Additionally, enhancing scientific and technological capacity is critical to achieving meaningful value addition and economic transformation. By focusing on these strategies, Africa can reduce raw exports, create jobs, and drive sustainable growth in the bioeconomy sector

The chair, Ben Durham concluded that all panellist stressed the importance of developing value chains to transform raw materials into value-added products, creating jobs, advancing knowledge, and leveraging science, technology, and supportive policies. A key takeaway was also the need for a comprehensive, whole-of-government approach to fully support and drive the bioeconomy forward.

The chair's next question to the panel focused on Africa's unique position as the custodian of the world's largest intact ecosystems, harbouring a quarter of global biodiversity and wild megafauna. Africa also boasts 65% of the world's arable land and 20% of the global tropical rainforest area, highlighting its significant role in global environmental and agricultural sustainability. The questions to the panellists were: Is Africa well positioned to chart and leverage bioeconomic development and what is needed to safeguard the environment and the well-being of people in developing the bioeconomy?

Peter Minang highlighted the urgent need to enhance the ecosystem benefits derived by local populations in the Congo Basin, emphasizing that poverty is a critical challenge. With the population in the region projected to grow from 75 million in year 2000 to 300 million by 2050, current conservation-focused investments have focused on conservation and neglected to address sustainable food and timber production. Productivity per hectare has stagnated over the last 30 years, leading to increased agricultural land expansion to

meet growing demands, threatening biodiversity. He stressed that without transforming food and timber production through sustainable intensification, biodiversity in the Congo Basin will disappear within 30 years. To safeguard the ecosystem and support local communities, a bioeconomy centered on sustainable timber production, increased food system productivity and ecosystem services is essential, benefiting both local populations and the global environment.

The chair emphasized that addressing poverty is absolutely critical and stressed the need for equity to be a fundamental pillar of bioeconomy development across the world. He then turned to Peggy Oti-Boateng, seeking her perspective on Africa's immense biodiversity and vast bioeconomy opportunities and whether this natural wealth could seamlessly translate into tangible benefits for African countries, and, if so, what measures must be taken to safeguard the environment and ensure the well-being of the people?

Dr. Oti-Boateng in her reply emphasized the hope and potential within Africa's bioeconomy, highlighting innovative research by a large number of young African scientists. Examples included plant tissue culture to boost fruit and vegetable production in Eswatini, eco-friendly antimicrobial products from banana waste in Congo, and oyster conservation linked to climate resilience in West Africa. She stressed the need to move research from the lab to market by building robust value chains, ensuring sustainability, and addressing gaps in fisheries and ocean-related industries. She called for better data evaluation, genomic repositories and alignment with the digital revolution to enhance knowledge sharing and innovation. She underscored the importance of open science and equitable information use to advance Africa's pharmaceutical and agricultural sectors. Finally, she advocated for multi-level policy frameworks that integrate bioeconomy development into Africa's sustainable growth strategies.

Dr. Jean Jacques Muhinda emphasized that while Africa possesses immense potential, neglecting to adopt sustainable practices could have detrimental effects on its ecosystems and biodiversity.He highlighted the need to shift to alternative production systems that reduce pressure on natural resources and biodiversity, especially in areas experiencing agricultural land expansion. Addressing the competition for biomass in agrarian communities, he underscored the importance of renewable energy as an alternative to preserve ecosystems. Additionally, he stressed reducing post-harvest losses and enhancing value addition in crop production to provide farmers with sustainable incomes and reduce their reliance on unsustainable land expansion and expanding into and degrading fragile ecosystem. Drawing comparisons to China's extensive value addition practices, he pointed out Africa's missed opportunities in this area. Finally, he stressed that many bioeconomy solutions are costly and require strong, evidence-based business cases to convince investors and policymakers, e.g. Ministries of Finance, of their long-term benefits for environmental conservation and economic returns.

The chair thanked the panellist and noted that there is a diversity of approaches to develop the bioeconomy with a multitude of interlinkages and a thus a need to collaborate moving forward and in providing bioeconomy solutions for Africa and the World.

Panel 2: Innovation and Entrepreneurship in Bioeconomy

Chair Prof Lucia Pittaluga,IACGB

The chair, Prof Lucia Pittaluga introduced the session by saying that entrepreneurs greatly impact the transformation towards the bioeconomy on the micro level by turning perceived opportunities into innovative biobased business models through an experimental learning process. In this panel 2 the focus is innovation and entrepreneurship in the bio economy looking at the innovation scene in Africa, with presentations from South Africa, Burundi and Tanzania.

Dr. Daniel Ndima, Chief Executive Officer, Cape Bio, South Africa CEO, presented his South African startup's adn its innovative use of AI technology for biomolecule discovery from microbial biodiversity in the unique Cape floral kingdom. Cape Bio employs AI, integrating bioinformatics, machine learning, and structural biology, to accelerate the identification of biomolecules for diagnostics and therapeutics, reducing reliance on lengthy traditional sequencing processes. The company has already developed products such as Africa's first PCR test during the pandemic and works with the Africa CDC on diagnostics for priority diseases. Recognizing the broader market potential, Cape Bio is launching its AI platform as a service to assist pharmaceutical companies in optimizing molecules and analyzing biological datasets. Supported by South Africa's Technology Innovation Agency, the company is seeking $3.5 million in funding to expand its operations and serve global markets. With its innovative platform, Cape Bio aims to tap into the growing AI-driven drug discovery market, projected to reach $5 billion by 2028, He concluded by emphasizing the platform's potential for advancing both local and global healthcare solutions.

Dr. Ginette Karirekinyana Founder and CEO, Karire Products Ltd, Burundi shared her journey from Canada to Burundi, where she initiated a project to combat malaria using catnip. Beginning as an NGO in 2014, the initiative evolved into a social business, Karire Products Ltd, which now commercializes over 30 plant extracts, focusing on essential oils and products derived from catnip and Artemisia. With community involvement at its core, the business buys plants grown by local farmers, creating jobs and economic and value addition opportunities. Supported by BioInnovateAfrica, the small operation has grown into a mid-sized business producing a wide range of products, including repellents, creams, and disinfectants. Catnip and Artemisia offer diverse benefits for human and animal health, environmental sustainability, and soil quality. The project has made a significant impact in Burundi, eliminating malaria epidemics since 2016 and contributing to public health, community development, and economic growth. Dr. Karirekinyana concluded by highlighting the project's success in job creation and community empowerment

Prof. Karoli Nicholas Njau, founder and CEO of ENVSOL Ltd in Tanzania, shared his work on innovative wastewater treatment and bioenergy recovery systems, focusing on an advanced dual reactor for biogas and fertilizer production. The reactor, developed with his student, addresses the lack of low cost robust, affordable, reliable research units for R&D and universities in the Global South. The reactor enables controlled digestion and composting processes, improving data reliability for research on additives and optimizing bio-digestion methods. The second iteration of the reactor incorporates enhanced automation, energy efficiency, and remote operation, making it a cost-effective and user-friendly tool. This innovation aims to reduce reliance on expensive international technologies with high maintenance costs and adapting the system to local needs. The reactor's reliable, reproducible data also promises practical applications for improving bioconversion, bioprocessing and turning biowaste to useful products. By developing and manufacturing the technology locally, the project supports regional capacity building and sustainability.

The chair, Lucia Pittaluga concluded the session saying that that these 3 examples of startups are not only fantastic startups, but they also resolve human development problems. **The Co-chair Ben Durham also agreed** on what was presented was truly inspiring, and noted that the panellist haven't talked about the challenges that they had to overcome to get to where they are. The point to note, he argued, was that that these entrepreneurial snapshots show the bioeconomy will develop in Africa, where the SMEs are the mainstay of the economic development, and also so in many part of the world,

Panel 3: Bioeconomy Pathways: Perspectives on Evolving Visions and Emerging Strategies in Africa, Latin America, and Asia

Chair Dr Francis X. Johnson, Senior Research Fellow
Stockholm Environment Institute, Sweden

The chair, Francis Johnson, opened the session by introducing the theme of bioeconomy pathways, perspectives, evolving visions, and emerging strategies across Africa, Latin America, and Asia. He acknowledged a shared understanding of the critical importance of the bioeconomy and its potential contribution to the Sustainable Development Goals (SDGs). However, he noted that there is less consensus on the pathways to achieve these goals. The Panellists will provide overview and examples of how bioeconomy pathways are unfolding in different regions, including Continental Africa, East Africa, Latin America, and Southeast Asia

Monica Trujillo Senior Researcher, Stockholm Environment Institute, Colombia discussed the diverse visions of the bioeconomy in Latin America, ranging from biotechnology-driven agricultural productivity and biofuels to approaches emphasizing economic growth, environmental sustainability, and social inclusion. The region's unique biodiversity, including the Amazon as a critical carbon sink, and its critical ecosystem services faces severe threats from deforestation, fires, and reduced river flows, making sustainable bioeconomy solutions essential. While addressing these challenges, the bioeconomy must also focus on job creation, and income generation. In terms of population, the Amazon region is remarkably diverse, encompassing over 700 indigenous groups and more than 500 languages, underscoring the importance of inclusivity and cultural sensitivity in shaping bioeconomy strategies. Costa Rica and Colombia launched their bioeconomy strategies in 2020, followed by Brazil, Ecuador, and Uruguay more recently. These strategies prioritize integrating bio-based economic growth with environmental sustainability and social inclusion. The recently established Latin American Bioeconomy Network fosters collaboration, knowledge exchange, and capacity building across over 60 institutions. Building on the G20's 10 High-Level Bioeconomy Principles, the network introduced its own High-Level Bioeconomy Principles for Latin America. Central to these principles is the importance of restoring, regenerating, and sustainably use biodiversity while ensuring the fair and equitable distribution of benefits, all in alignment with the SDGs. The bioeconomy is also viewed by the network as a bridge between the UN biodiversity and climate change agendas. Monica emphasized the coexistence of diverse bioeconomy models in the region, ranging from small-scale biodiversity-based systems to high-tech agricultural bioeconomies. She highlighted the need for policy mechanisms and support systems that ensure both approaches effectively contribute to sustainable development.

Fortunate Myambi, Deputy Executive Director of the East African Science and Technology Commission (EASTECO), highlighted the significant potential of the bioeconomy in East Africa to drive sustainable industrialization, create jobs, promote green growth, and improve food security. A key initiative in the region has been the development of the East African Regional Bioeconomy Strategy. Key priorities in the strategy includes strengthening food systems through value addition, processing, and resilient agricultural practices linking farmers and bio-entrepreneurs to local, national, and international markets. The second key priorities is Health and Wellbeing developing a biobased healthcare sector contributing towards a healthy population with improved well-being, addressing regional priorities and building on indigenous knowledge and practices. The third priority is Bio-based Industrial Development developing industries that stimulate sustainable economic growth and add value to underutilised renewable resources in the region including waste management and conversion of biowaste and municipal into useful products. The final priority is Sustainable developing a range of bioenergy products for both household and industrial use. The East African Regional Bioeconomy Strategy is now serving as an inspiration and guide for countries in the region developing their national bioeconomy strategies. In collaboration with BioInnovate Africa and the Stockholm Environment Institute (SEI), EASTECO has developed two Regional Bioeconomy Status Reports, one in 2022 and another in 2024 launched here at the GBS2024 summit. These reports highlight and monitor bioeconomy progress in the region, while identifying priority areas for action. EASTECO has also established a Bioeconomy Observatory, a knowledge-sharing portal that provides a regional open-access repository for bioeconomic data and information. Additionally, EASTECO has collaborated with SEI and BioInnovate Africa to organize regional bioeconomy conferences aimed at increasing stakeholder awareness, strengthening coordination, and fostering collaboration and partnerships across the region

Dr. Warithorn Sankasiri, Director Biochemical Engineering and System Biology Research Group National Center for Genetic Engineering and Biotechnology Thailand, provided insights into the country's bioeconomy initiatives under the BCG (Bio-Circular-Green) economic model, which was declared a national agenda in 2021. A key aspect of the strategy is leveraging Thailand's unique strengths in biodiversity and cultural diversity to drive sustainable economic growth. The policy focuses on four sectors—Food & Agriculture, Medical & Wellness, Energy & Biochemicals, and Creative Economies—with the goal of increasing their GDP contribution from 21% to 24% by 2026. The strategy leverages Thailand's biodiversity and cultural diversity, supported by aligned policies, regional economic corridors, and incentives for investors and researchers. She also highlighted a successful national cassava starch net-zero emission roadmap, aiming to reduce carbon emissions by 50% by 2030 through practices such as optimized fertilization, renewable energy, and increased productivity. Thailand has also expanded these efforts to ASEAN countries, creating a sustainable cassava value chain through regional coordination and multi-stakeholder partnerships. The initiative is built on three main pillars, (i) knowledge dissemination for cassava cultivation, starch and biogas production, byproduct management, carbon footprint reduction, energy and resource efficiency. (ii)technological innovation, leveraging proven local technologies developed in Thailand and expanding them regionally and (iii) a strong global network aimed at scaling these sustainable practices globally. Stakeholders are invited to join this initiative to further enhance the cassava value chain and promote sustainability worldwide.

Dr. Aisha M. Nakitto, Department of Policy Innovations, AKADEMYIA2063, presented the African Union's Agenda 2063 and its alignment with the bioeconomy. Agenda 2063 aims to achieve seven aspirations for Africa's long-term development, including inclusive growth, sustainable development, and youth empowerment. Aspiration 1 and 6 envisions a prosperous Africa driven by sustainable development, where bioeconomy initiatives tackle youth-led enterprises., youth unemployment and youth-led enterprises, while strengthening bio-based industries such as food processing and renewable energy. By adding value to biowaste and organic residues, the bioeconomy creates value-added products, supports biodiversity conservation, and fosters climate-resilient economies Aspiration 7 highlights the need for Africa to self-finance development through innovative initiatives, further linking the bioeconomy to the continent's growth goals. Aisha Nakitto referenced the Malabo Montpellier Panel's report, which identifies policy options to advance Africa's bioeconomy, particularly in food processing. The report stresses the importance of cross-sectoral partnerships, investment in research, capacity building, and empowering youth to drive progress in achieving Agenda 2063's goal.

The panel chair followed up on these presentation by asking panellists how one can harness knowledge from local and indigenous communities to have a broad constituency for advancing the bioeconomy. **Moncia Trujillo** agreed that harnessing knowledge from local and indigenous communities to advance the bioeconomy is crucial and should be integrated into regional and national strategies. She emphasized the importance of documenting and systematizing traditional knowledge to ensure its recognition and prevent it from being overlooked. This knowledge provides alternative perspectives on production systems and livelihoods that are vital for the bioeconomy. She highlighted the need for a "dialogue of knowledge," a concept gaining traction in regions like Colombia, which promotes the exchange of diverse knowledge systems. As an example, she mentioned biochar, a land-based climate mitigation technology originating from the Amazon and developed by indigenous communities. The biochar example demonstrates how traditional knowledge can inspire valuable solutions to biodiversity loss and climate change which underscores the critical role of indigenous contributions in addressing global challenges. **Fortunate Myambi** explained that the East African Community (EAC) is currently focused on inventorying indigenous knowledge within the region to create a comprehensive database identifying and documenting various indigenous practices that have largely remained undocumented. Additionally, the EAC has also developed a regional Indigenous knowledge strategy to guide the management, use and preservation of this vast culturally significant knowledge. The initiative also emphasizes the importance of protecting the intellectual property rights of individuals and communities who have maintained and used this knowledge over time. **Warithorn Sankasiri** responded by highlighting the importance of biodiversity and the extensive indigenous knowledge surrounding its utilization in Southeast Asia. She emphasized the need to bridge the gap between modern science and traditional knowledge, fostering trust and integrating both into a shared, locally adaptable knowledge base. Furthermore, she stressed the importance of prioritizing access and benefit-sharing mechanisms with local communities to ensure equitable collaboration and the preservation of these valuable resources. **Aisha M. Nakitto** agreed on the need to create inclusive platforms for knowledge sharing that involve all stakeholders, including scientists, indigenous communities, and policymakers. Such knowledge sharing could be achieved through community-based workshops and digital platforms that foster dialogue and engagement. These discussions would help build trust among stakeholders, encouraging open knowledge exchange and the development of community-based innovations.

Concluding comments on Plenary Session III

The session chairs, Lucia Pittaluga and Ben Durham thanked the speakers and panellists and concluded the session with some reflections. Prof. Pittaluga emphasized the importance of well-crafted public bioeconomy policies. These policies should incentivize bioproduct development while placing equal importance on environmental sustainability and social development. The discussions underscored the critical role of public-private partnerships in achieving bioeconomy goals by fostering collaboration and resource sharing. Bioeconomy-based start-ups were recognized as key drivers of transformation; however, a significant obstacle is the lack of available financing, including venture capital, angel investors, and public funding. Mobilizing such funding is essential, and Brazil's Development Bank serves as an inspiring example, financing strategic projects aligned with bioeconomy objectives. She highlighted the uncertainty surrounding the promises of green job creation in the bioeconomy. Collaborative studies in Southern Latin America reveal that digitalization in agriculture and forestry is transforming tasks and may attract younger generations. Yet, the creation of sufficient quality green jobs to meet the needs of countries in the Global South remains unclear. Further research is required to better understand the quantity and quality of these jobs and to ensure that they provide decent work.

Ben Durham shared that South Africa will hold the G20 presidency next year and will advance its bioeconomy initiative, with more updates to come throughout the year. He emphasized that the bioeconomy is a vast, diverse, and complex enterprise with no single pathway or roadmap, but having a clear vision is essential. This vision should guide stakeholders, efforts, and enterprises in a complementary and value-adding manner. He highlighted the International Advisory Committee on Global Bioeconomy (IACGB) Communique as a key document outlining a vision for the future of the bioeconomy. A major takeaway from the session is that the bioeconomy represents a paradigm shift, requiring a transition from a fossil-based economy to a biobased one. Effective communication and influencing of mindsets are critical to achieving this shift. However, addressing global development challenges, particularly ensuring equity, is fundamental to this new paradigm. These challenges, rooted in the previous economic model, must be tackled to create a sustainable and inclusive bioeconomy

Plenary Session IV:

Way Forward: Science, Partnership, Shared Responsibilities and Joint Platforms; Bioeconomy in the Global Agenda

Session Chairs: Dr Órlaith Ni Choncubhair and Hugo Chavarria, IACGB

Speakers

Dr Maximo Torero, Chief Economist, FAO (Peru (video message) stressed that the rising demand for biomass across all sectors necessitates transformative changes in resource management and ecosystem protection, with science playing a pivotal role. The bioeconomy offers a crucial opportunity to balance human needs with environment protection. He argued that the agrifood system is central to the bioeconomy, playing a crucial role in producing renewable biological resources while addressing global hunger and improving nutrition. As bioeconomy development progresses, it is essential to prioritize food security and nutrition goals, creating more efficient agrifood systems and producing more with less. Innovation is key to how we produce food and manage natural resources, supporting the goals of environmental, social, and economic sustainability. Bioeconomy innovations can empower smallholders and rural communities creating improved income opportunities through sustainable practices in forestry, fisheries, and regenerative agriculture, while biobased products open new markets. Integrating bioeconomy strategies into agrifood transformation offers a unique opportunity to drive efficiency, equity, circularity and resilience. He stressed that for the bioeconomy to succeed, it must incorporate just transition principles, ensuring diverse group participation and equal growth opportunities for small-scale producers, indigenous groups, women, and youth while addressing historical inequalities and avoid creating new ones. A comprehensive roadmap is essential to guide this process, balancing improved efficiency with equitable redistribution to an inclusive transformation. He highlighted FAO's role as a global leader in bioeconomy development, being the first UN agency to establish a priority bioeconomy program for sustainable food and agriculture. With a strategic focus on production, nutrition, environment, and better lives, FAO is well-positioned to lead global multistakeholder bioeconomy partnerships. Coordination across existing initiatives, such as the G20, G7, COPs, and the Global Alliance against Hunger and Poverty, is critical to integrate the bioeconomy into broader transformation efforts. This requires aligning knowledge, financing, and technological implementation attracting investments and propelling systemic change. Acting quickly and ensuring convergence of bioeconomy initiatives is essential to ensuring food security for today and the future, while advancing sustainable and inclusive global development.

Ambassador André Corrêa do Lago, Secretary for Climate, Energy, and Environment at Brazil's Ministry of Foreign Affairs, (video message), addressed the Global Bioeconomy Summit, emphasizing Brazil's commitment to the bioeconomy. As the G20 president in 2023, Brazil launched the G20 Initiative on Bioeconomy, which resulted in the adoption of 10 principles to be formally endorsed by G20 leaders in November. These principles highlight the critical balance between science and traditional knowledge, acknowledging the role of Indigenous and traditional communities in preserving biodiversity. The ambassador stressed that the bioeconomy must integrate environmental, economic, and social dimensions to achieve true sustainable development. He also highlighted Brazil's preparations for COP30, which will be hosted in Belém, the first time the climate conference will take place in the Amazon. This event aims to demonstrate that forests are key solutions to global challenges, contrary to the perception that they are sources of problems. He emphasized the need for transformative changes to global economies to adopt more sustainable paths, with the bioeconomy playing a central role. Ambassador Corrêa do Lago concluded by thanking participants for their contributions to bioeconomy discussions, which will greatly inform Brazil's efforts leading up to COP30

Prof. Xian-En Zhang, Dean and Chair Professor, Faculty of Synthetic Biology, Shenzen University of Advanced Technology, China provided a detailed overview of synthetic biology and its transformative impact on biotechnology and the bioeconomy. He outlined the historical development of life sciences, from classical genetics to molecular biology, systems biology, and the current era of synthetic biology. This field, characterized by the design and synthesis of biological systems, has advanced significantly with technologies like CRISPR gene editing, AI-driven protein design, and metabolic engineering. He highlighted groundbreaking achievements such as the synthesis of high-value biochemicals, plant-based medicines, and sustainable materials like polymers, which are set to replace petrochemical products. Synthetic biology has also enabled rapid vaccine development and holds potential for creating universal vaccines. Prof. Zhang emphasized the interdisciplinary nature of synthetic biology, which incorporates AI, organoid engineering, and other emerging technologies to address challenges in healthcare, agriculture, bioenergy, and climate resilience. China's proactive role in advancing synthetic biology includes a dedicated research program, a synthetic biology roadmap, and initiatives like the annual bioeconomy report. Professor Zhang underscored the importance of collaboration between academia, industry, and governance to promote innovation and ensure ethical and sustainable applications. He concluded by highlighting synthetic biology's role in driving the next generation of bio-manufacturing and the global transition towards a green, sustainable, and efficient bioeconomy.

Vikash Abraham, Chief Strategy Officer of Naandi, India shared insights into their efforts to transition over a million small farmers in India from conventional to regenerative agriculture without compromising yields or food security. Naandi has worked with small farmers for 25 years, employing three financial vehicles: philanthropy, social businesses, and carbon financing. Their regenerative agricultural hubs provide farmers with inputs, farm services, and market access, using local materials like paddy stubble to create high-quality compost, ensuring sustainability and affordability. Naandi leverages technology to simplify regenerative practices, offering farmers personalized schedules through a digital platform while collecting data to refine methods. Their approach emphasizes the science of plant nutrition, transitioning lands reliant on water-soluble fertilizers to symbiotic biological pathways. The organization's Center of Excellence integrates traditional practices with modern science to design nutrient-dense, sustainable farming systems. Currently working with 150,000 farmers across India, Naandi ensures 100% traceability from farm to market, offering low-carbon, high-quality produce to consumers. Vikash emphasized the need for behaviour change, challenging the audience to rethink plant nutrition and redesign food systems to align with nature, promoting efficiency, resilience, and sustainability.

Panel 1: Bioeconomy Transformation

Talash Huijbers, Founder & CEO, InsectiPro Ltd, highlighted the potential of insects in creating sustainable food and feed systems. Globally, two billion people already consume insects, and the insect protein industry is projected to grow from $50 million to $3 billion by 2030. Talash emphasized the circularity created through insects, where organic waste is recycled into high-value protein for animal feed and organic fertilizer, both of which enhance agricultural yields and reduce environmental impacts. InsectPro processes significant volumes of waste, recycling 22,000 metric tons so far, offsetting 18,000 tons of carbon, and supporting 80,000 farmers in adopting organic fertilizers and regenerative agricultural practices. The company focuses on three insect species: black soldier flies for feed, crickets for human nutrition, and mealworms for biotechnology, with products like dried feed, fertilizer, and cricket-based snacks.Talash also stressed the efficiency and environmental benefits of their operations, which run largely on solar energy. Clinical trials have validated the nutritional value of their products, ensuring safety and market readiness. InsectPro's work demonstrates the integration of traditional knowledge and modern science to address food security, waste management, and sustainability challenges, contributing to a greener economy.

Professor Stephanine Baumberger, Institut Jean-Pierre Bourgin, AgroParisTech, Universite Paris-Saclay, France highlighted the critical role of science in advancing the bioeconomy. She emphasized that science is essential not only for generating the knowledge, tools, and methods needed for innovation but also for assessing the ecological impact of these innovations. Science plays a crucial role in guiding policymakers and decision-makers, carrying the responsibility of shaping informed strategies. She highlighted the importance of open science in disseminating knowledge, noting that the proportion of open-access publications in the bioeconomy field has increased from 30% to 50% in just four years, with further progress still possible. Lastly, Professor Baumberger underscored that science fosters global collaboration and acts as a catalyst for synergies across disciplines and sectors, driving collective efforts toward sustainable bioeconomic development.

Dr. Rose Mwebaza, Regional Director for Africa, United Nations Environment Programme (UNEP), Uganda, emphasized the critical role of partnerships in advancing Africa's bioeconomy. UNEP focuses on convening member states and fostering collaboration, particularly around the "triple planetary crisis" of climate, nature, and pollution. A key initiative has been the development of Africa's Natural Capital Atlas, which digitizes the continent's natural assets to support sustainable use, including carbon markets, regenerative agriculture, and bio-industrialization. This effort aligns with UNEP's collaboration with the African Development Bank to transform these assets into real investments and jobs. Rose Mwebaza highlighted Africa's rich biodiversity, which accounts for two-thirds of the world's biodiversity, and its potential to drive innovation and sustainable growth through practices like regenerative agriculture and bio-based technologies. She noted the importance of youth inclusion, as Africa's young and aspirational population demands solutions that create meaningful employment. She also praised innovative projects in Africa, such as biodegradable products made from cassava starch, which address urban waste challenges while supporting bio-industrialization. She stressed that Africa's leadership in the G20, particularly under South Africa's presidency, provides a unique opportunity to align continental priorities with global bioeconomy discussions. She concluded by reaffirming UNEP's commitment to fostering partnerships across sectors to support Africa's sustainable growth and bioeconomic transformation

Anamika Dey, Chief Executive Officer, GIAN, India highlighted her organization's efforts to identify and support grassroots innovators, particularly in rural sectors such as farming, artisanal crafts, and mechanics. These innovations address gaps left by markets and governments, often using local resources to solve small-scale but significant challenges. Through a network of students, universities, and open-source databases, GIAN has documented over 100,000 grassroots innovations and 350,000 traditional knowledge practices, making these resources accessible to the public. Anamika Dey emphasized the importance of creating products from abundant and abandoned resources, such as agricultural waste, and integrating traditional knowledge into modern medicine. These efforts are environmentally friendly and include fair benefit-sharing, with communities receiving recognition and financial returns for their contributions. GIAN also facilitates connections between innovators, entrepreneurs, and investors, helping bring innovations to market by matching skills and resources. To support innovation, GIAN relies on partnerships with volunteers, scientists, and professionals who contribute their expertise without charging fees. Dey underlined the need for collaborative platforms to empower grassroots innovators, traditional knowledge holders, and bio-entrepreneurs, fostering trust and partnerships to create sustainable solutions and enhance livelihoods. She called for collective efforts to build a better, more inclusive world through innovation.

Lara Kotze-Jacobs, CSIR, Program Manager, Biomanufacturing Industry Development Centre. South Africa emphasized the organization's mandate to improve lives through science and innovation. The CSIR supports small enterprises in the bioeconomy by providing scientific expertise, infrastructure, and product development support, helping de-risk the transition from ideation to commercialization. This makes it easier for investors to back these businesses, accelerating their growth and market readiness. The CSIR also prioritizes workforce development, offering internships, scholarships, and training programs for South Africans and other African nations. Supported by partners like the Bill and Melinda Gates Foundation and GIZ, the initiative equips individuals with skills for the biomanufacturing industry. Over the past eight years, the CSIR has supported 60 enterprises, created approximately 400 jobs, and transferred 120 products to market-ready businesses.These efforts have had a tangible impact on South Africa's bioeconomy, with many supported enterprises still successfully operating in the market today, contributing to job creation and economic growth. Kotze-Jacobs highlighted the importance of collaboration and innovation in driving sustainable industrial development.

Francis Sullivan, Chair of the Sustainable Biomass Program UK/Canada, emphasized the need for meaningful collaboration in the global bioeconomy. Reflecting on how communication has evolved from traditional mail and phone calls to modern digital platforms, he cautioned against superficial collaborations where stakeholders participate without deriving real value. For partnerships to be effective and sustainable, each stakeholder must clearly understand the benefits they will gain, whether it is reducing risks, increasing revenue, decreasing costs, or accessing new markets.

Sullivan highlighted the importance of explicitly defining these objectives before initiating collaborative processes. He urged participants to focus on genuine value creation rather than relying solely on email groups or virtual meetings. His remarks underscored the need for thoughtful and results-driven approaches to collaboration within the bioeconomy sector.

Panel 2: Bioeconomy Partnerships

Chair Dr Elspeth MacRae

The chair explained that the IACGB has been actively engaging with various bioeconomy networks and platforms to foster collaboration, share perspectives, and align visions of the bioeconomy. Discussions have focused on organizing joint meetings and initiatives to exchange knowledge and grow global bioeconomy thinking. This collaborative approach aims to strengthen connections and advance shared responsibilities in shaping the future of the bioeconomy. In the session a number of bioeconomy networks, initiatives presented their aim, scope and key activities.

The European Space Agency (ESA) Space Solutions collaborates with European businesses to harness space technology for socioeconomic benefits, focusing on the green transition and a sustainable, digital future. ESA launched the Bioeconomy Task Force in the Netherlands in October 2024 to develop sustainable solutions for bioeconomy challenges using space technologies. This Task Force brings together leading stakeholders to promote innovative space-based technologies, enhance their impact through sector collaboration, and identify key priorities for sustainable and circular bioeconomy practices. Its goals include fostering socio-economic growth, supporting environmentally responsible development, and contributing to the United Nations' Sustainable Development Goals. The Task Force supports industries such as agriculture, forestry, waste management, textiles, and pharmaceuticals by driving innovation and scalable solutions for bioeconomy challenges. Inaugural members include prominent organizations such as CEPF, COPA-COGECA, EUSTAFOR, GOTS, IACGB, Rabobank, and the World Economic Forum's 1 Trillion Trees Platform, highlighting a strong commitment to advancing a sustainable green economy.

The European Bioeconomy University Alliance was presented by **Martin Greimel, Centre for Bioeconomy at the University of Natural Resources and Life Science, Vienna.** The Alliance is a collaboration of eight leading universities in the bioeconomy sector, bringing together diverse cultural and geographical perspectives from Scandinavia to Italy, and even engaging with African dimensions. Over the past five years, the alliance has focused on building mutual understanding through extensive discussions, fostering a unified network despite differing viewpoints. This collaboration emphasizes the efficient use of limited resources in research and education, aiming to reduce overlaps and fill knowledge gaps. The alliance serves as a model for global cooperation, demonstrating the value of shared efforts in addressing challenges in the bioeconomy. Expanding this approach to a global level could significantly enhance collective progress and innovation

World Economic Forum (WEF) Bioeconomy Initiative was presented by **Valeria D'Amico and Dr. Chris Yates,**(WEF) highlighting WEFs efforts to advance the bioeconomy through collaboration and technology-driven solutions. The WEF Forum acts as a trusted platform for public and private cooperation, fostering partnerships between government, civil society, and business leaders to promote a sustainable and equitable world. Within the Forum, the Bioeconomy Initiative, launched two years ago, aims to accelerate the adoption of bio-based and tech-driven solutions globally. The initiative focuses on leveraging advanced technologies like synthetic biology, AI, sensing, and automation to enhance the scope and scalability of bio-based applications, driving the transition to a bioeconomy. Despite progress, the bioeconomy is not yet mainstream, and efforts are needed to integrate bio-innovation into society, create customizable solutions, and build scalable commercial models. Through robust working groups and a global bioeconomy community, the initiative develops insights and fosters dialogue among public and private leaders. The ultimate goal is to unlock the potential of bio solutions across value chains and regions, driving global adoption and realizing the benefits of a technology-powered bioeconomy.

FAO Bioeconomy Strategic priority programme on the Bioeconomy was presented by Lev Neretin, Environment Team Lead at FAO who emphasized the importance of global cooperation and coordination in advancing the bioeconomy. He highlighted the need to integrate diverse networks, partnerships, and mechanisms across dimensions such as technologies, data, indicators, and the private sector. Representing the FAO and the UN system, Lev Neretin expressed optimism about increasing engagement from multilateral banks and other stakeholders in future forums.

He noted that the FAO's universal membership has recognized the bioeconomy as one of its 20 strategic priorities, underscoring its significance for global development. He also the stressed the importance of incorporating the United Nations system and multilateral discussions into bioeconomy debates to strengthen collaboration. He concluded by acknowledging the growing understanding and support for the bioeconomy across various sectors and organizations.

The Latin American Bioeconomy Network, was presented by **Dr. Hugo Chavarría, Inter-American Institute for Cooperation on Agriculture (IICA)** highlighted the progress and pride in the creation of the Latin American Bioeconomy Network, established just 1.5 years ago. Initially comprising around 30 institutions, the network has now grown to 60 organizations across ten Latin American countries, working collaboratively to promote the bioeconomy. Despite regional differences in bioeconomic approaches—such as those in Brazil, Colombia, Argentina, or Costa Rica—the challenges remain similar and significant, underscoring the need for synergy. The network focuses on five key areas: establishing guiding principles for the bioeconomy, developing strategies and policies, fostering incubation and scaling of bio-ventures, advancing science and technology, and promoting Latin America globally in bioeconomy forums. Their efforts include active participation in events like COP 16, with workshops and seminars to spotlight the region's biodiversity and bioeconomic potential. The network's mission is to position Latin America as a key player in the global bioeconomy, fostering collaboration both within the region and internationally.

The International Bioeconomy Forum (IBF) was presented by **Peter Wehrheim, Head of Unit for "Bioeconomy and Food System", DG, Research and Innovation, European Commission,** a platform for fostering global collaboration in research and innovation related to the bioeconomy. The IBF has been active since 2016, supporting the bioeconomy's foundation in science and innovation. It operates through five working groups addressing key areas like biorefineries, forest-based bioeconomies, and ICT in food systems, engaging government-led agencies and observing organizations worldwide. The forum aligns closely with the Global Bioeconomy Summit, holding plenary meetings alongside it to enhance synergy. Delegates from the IBF actively participate in these global events, promoting dynamic discussions and cooperation. Peter Wehrheim encouraged interested stakeholders to join, emphasizing the IBF's role in advancing bioeconomy research and innovation. He expressed optimism about increased momentum in the forum's activities in the coming year.

The Global Bioeconomy Alliance was presented by **Professor Volker Sieber, Technical University of Munich (TUM), Germany** an initiative connecting global bioeconomy efforts. The Alliance was established by TUM in collaboration with the University of Queensland, Universidade Estadual Paulista (UNESP), Brazil, and Danish Technical University, (DTU). It aims to unite leading academic players, governments, industries, and startups worldwide. Its activities focus on sustainable agriculture, food production, integrating hydrogen into the bioeconomy, sustainability assessments, and sustainable mining. The Alliance fosters student exchanges, runs an Erasmus Mundus program, and serves as a hub for industry collaboration, addressing technological bottlenecks and providing sustainability analysis. It recently launched an annual conference, with the next edition in Copenhagen, Denmark emphasizing regional knowledge and advancing local bioeconomy initiatives. Additionally, the alliance collaborates with the Novo Nordisk Foundation to grant €115,000 awards for impactful innovations, policies, or societal contributions, further driving global bioeconomy advancements. The Alliance also strives to expand its efforts to ensure comprehensive global representation.

Concluding remarks

The chair Dr MacRae emphasized the importance of creating opportunities to bring everyone together to share and collaborate on the many emerging initiatives in the bioeconomy and expressed hope for organizing such a gathering in the coming year to foster a collective

Plenary Session V:
GBS2024 workshop Summaries and Communiqués

Session Chairs: Prof Christine Lang, Dr Elspeth MacRae, and Dr Julius Ecuru, Chair/Co-chairs IACGB

This session entailed presentations of the following

- Report back on GBS2024 workshops, day 1 and day2: For Report see page 69
- The GBS2024 Communique: For Communique, see https://gbs2024.org/news/iacgb-communique/
- The Global Bioeconomy2024 Summit Youth Communique: see https://gbs2024.org/news/iacgb-youth-communique/

Farewell and Closing of the Global Bioeconomy Summit 2024



Co-Chairs: Prof Christine Lang, Dr Elspeth MacRae, and Dr Julius Ecuru, Co-Chairs, IACGB

In the closing session, **Prof. Christine Lange, the IACG chair** described the Global Bioeconomy Summit 2024 as highly successful and impactful, highlighting the valuable exchange of experiences among participants. She emphasized the valuable insights gained into the global status of the bioeconomy world-wide and its alignment with market trends and developments. The summit enhanced mutual understanding among participants. She expressed admiration for all the bold and ambitious bioeconomy program and initiatives, impressive bioeconomy enterprises, and promising regional and global collaborations, which for her stood out as key highlights of the Summit. The transition from Germany to Africa was a challenging, yet a very rewarding move that opened new perspectives. She noted the urgency of accelerating actions in the bioeconomy which was a recurring GBS2024 theme, encouraging participants to carry this momentum forward. The GBS Workshops resulted in a multitude of commitments to ongoing collaborations and actions beyond the summit, and the emergence of a global bioeconomy partnership was celebrated as a significant achievement. She also emphasized the growing momentum across politics, science, technology, education, and the private sector, all of which will shape the bioeconomy's future. Looking ahead, she announced that GBS participants will reconvene in two years to review progress and revealed that Ireland will host GBS 2026, an exciting event to look forward to. The transition marks a continuation of the GBS legacy, moving from Kenya to Ireland to further advance bioeconomy discussions globally. She invited Patrick Barrett from the Irish Government to share some thoughts on what to expect at the upcoming summit

Patrick Barrett, representing the Irish government, announced **that Ireland was honoured to host the next Global Bioeconomy Summit (GBS) in 2026.** Ireland aims to showcase its progress in the bioeconomy, emphasizing climate action, sustainable food systems, rural development, and innovation-driven competitiveness. Barrett emphasized that they have listened carefully over the past few days, understanding the importance of bioeconomy platforms in translating evidence into action and recognizing the vital role of youth in shaping the bioeconomy's future. Ireland is committed to co-creating and co-designing the GBS2026 in collaboration with global stakeholders, incorporating ideas and addressing global concerns such as climate change, biodiversity, and sustainability. The 2026 GBS Summit will emphasize the integration of efforts from local to global levels. Inviting participants to Dublin, Barrett concluded with an Irish proverb: "There is no strength without unity," reinforcing the call for collective progress in the bioeconomy.

Prof. Christine Lange also took a moment to express her gratitude to those who contributed to the success of the summit. She began by thanking Dr. Julius Ecuru, head of BioInnovateAfrica for his excellent leadership of the GBS host team, acknowledging his outstanding efforts. She also extended her appreciation to the members of the IACGB, which she described as feeling like family or close friends. and praised their dedication, enthusiasm, and collaborative spirit, Lange emphasized that the event would not have been possible without their hard work and commitment. Christine Lange also expressed her gratitude to the donors and sponsors whose support made the GBS2024 possible. She acknowledged the incredible contributions of the speakers, panellists and workshop organizers, who inspired participants with their ideas, discussions, and visions. The moderators were also praised for keeping the sessions dynamic, on time, and engaging. Finally, she finally thanked all the attendees for their active participation, networking, and sharing of perspectives during the talks, debates, and informal gatherings. She emphasized that each contribution played a vital role, and that this collective effort made the Summit a great success.

Julius Ecuru of BioInnovate Africa reflected on the historic success of GBS 2024, the first summit held in Africa, marking a significant milestone as it transitioned from Germany to Nairobi, Kenya. With nearly 500 in-person participants and over 2,000 virtual attendees from 67 nationalities across six continents, the event showcased diverse global engagement. He acknowledged the momentum gained for advancing the African bioeconomy and congratulated Ireland on hosting GBS 2026, wishing them success and extending hopes for continued collaboration. Dr. Ecuru praised the bold contributions of participants, the efforts of sponsors and co-sponsors, and the commitment of the IACGB, the Youth Champions and team members who worked tirelessly behind the scenes.. He also expressed gratitude to the exhibitors, the event managers, Safari Park Hotel, and his BioInnovate Africa colleagues for their exceptional contributions. He concluded by encouraging participants to share the summit's outcomes widely and report progress at GBS 2026, leaving with a call for unity in shaping a sustainable global bioeconomy.

Full Workshop Reports

Note

There were altogether 24 different Bioeconomy workshops during the GBS2024 divided into three different blocs ,one morning and one afternoon bloc on Day 1 of the Summit (Workshops/Breakout Session I and II) and one morning bloc on day 2 of the Summit (Workshops/Breakout Session III). All these workshops are summarised into in the below section

Breakout Session 1 (Day one–Morning)

Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy

Workshop 1

An Intergenerational Dialogue: How to Bridge Youth Visions for Bioeconomy with International Policies on Bioeconomy and thought Leaders to Shape a Sustainable Future?

Organisers: FAO, World Food Forum, IACGB Youth Champions, EU Bioeconomy Youth Ambassadors (Contact person: ZZZZ)

Key Objective(s): To foster an intergenerational dialogue to build a sustainable bioeconomy.

Approach/Purpose

The collaborative atmosphere facilitated sharing of clear visions for meaningful engagement between youth and policymakers to jointly shape a sustainable bioeconomy. Youth representatives—alongside international policymakers, scientists, and government representatives—discussed common challenges and explored solutions to align youth aspirations with international bioeconomy policies, drawing on the FAO study: "Opportunities for Youth in the Bioeconomy."

Key Results/Priorities

- Need to bridge the gap in access to education and vocational training tailored to local realities: equip young people with the knowledge and skills to actively contribute to bioeconomy development and establishing contextualized educational programs that align with regional bioeconomic opportunities and challenges.
- Develop and institutionalize effective mechanisms to include youth in policymaking processes, from design to implementation: youth voices should be meaningfully integrated into bioeconomy decision-making and policies to reflect their perspectives and aspirations. Structured engagement platforms and mentorship opportunities could empower young leaders to contribute to bioeconomy strategies at national and international levels.
- Ensure a just transition to a sustainable bioeconomy: prioritize social equity and inclusivity in bioeconomy initiatives, ensuring that marginalized communities, including women and indigenous youth, have access to opportunities and resources. Policies should recognize and leverage youth contributions while addressing systemic barriers to youth participation.

Concluding Thoughts

Global coordination and cross-regional cooperation on bioeconomy development can encourage best practices, foster joint initiatives, and develop financing mechanisms for youth-led bioeconomy projects. The workshop concluded with a joint call to action, urging global leaders, policymakers, and practitioners to support youth-driven bioeconomy initiatives and commit to intergenerational collaboration, especially to strengthen connections between youth and policymakers, paving the way for future partnerships.

Workshop 2

Bioeconomy Meets One Health – How to Develop Regional Value Creation Ecosystems Based on Medicinal Plants and Herbs Cultivation

Organiser: University of Greifswald

Key objective(s): To explore the intersection of bioeconomy and the One Health approach by focusing on the cultivation of medicinal plants and herbs as a foundation for sustainable regional value chains.

Approach/Purpose

The workshop brought together experts from academia, industry, and community-based organizations to discuss how integrating traditional knowledge with modern scientific practices can generate economic, social, and environmental benefits. Participants emphasized the critical role of knowledge at every stage of the medicinal plant value chain, including cultivation, harvesting, processing, analysis, and marketing. The session highlighted the need to preserve, protect, and equitably share traditional knowledge while enhancing the skills of growers, processors, and marketers to strengthen local bioeconomic ecosystems.

Key Results/Priorities

- Developing community-based value ecosystems: Prioritizing local engagement and protecting traditional knowledge is key to strengthening the medicinal plant sector. Discussions highlighted the need to ensure quality and safety in medicinal plant production through improved access to reference substances, analytical capabilities, and pharmacognosy expertise.
- Strengthening regulatory frameworks: Establishing quality assurance mechanisms and compliance with international standards is essential to scale medicinal plant-based bioeconomic activities while ensuring sustainability.
- Identifying key challenges and opportunities: The session highlighted gaps in infrastructure, financing, and capacity-building initiatives, which are necessary for scaling up operations. Participants also acknowledged the potential of medicinal plant cultivation in promoting rural development, job creation, and biodiversity conservation.
- Facilitating knowledge-sharing and partnerships: The workshop emphasized the importance of fostering collaboration between research institutions and local communities, enabling knowledge transfer to support the sustainable development of medicinal plant value chains.

Concluding Thoughts

A major outcome of the workshop was the agreement on next steps to advance regional collaboration by establishing knowledge-sharing platforms, strengthening partnerships, and aligning efforts with international One Health initiatives. The session reinforced the potential of medicinal plants and herbs as key bioeconomic resources and called for policies that support regional bioeconomy initiatives while integrating scientific advancements with traditional practices. Participants committed to furthering a holistic, inclusive approach that ensures trust, equality, and mutual benefits among all stakeholders involved in the medicinal plant value chain.

Workshop 3

Exploring Global Collaboration Opportunities for Universities in the Bioeconomy Field

Organiser: European Bioeconomy University Alliance (EBU)

Key objective(s): To explore the potential for establishing a global network of universities to foster collaboration in the bioeconomy field, promote knowledge exchange, and build interdisciplinary partnerships for sustainable bioeconomic development.

Approach/Purpose

The workshop convened participants from diverse academic institutions across multiple continents to discuss opportunities, challenges, and pathways for enhanced collaboration in bioeconomy education and research. The session began with a pre-survey presentation, which outlined the current state of university collaboration, identifying gaps and opportunities for expanding partnerships. Participants agreed that forming a structured global university alliance could create significant advantages in terms of joint research, capacity-building, and interdisciplinary cooperation. Best practice examples from different regions were shared, underscoring the importance of regional collaboration in advancing sustainable bioeconomy solutions.

Key Results/Priorities

- Establishing a Global Bioeconomy University Alliance (GBU): Participants acknowledged the clear advantage of forming a formalized global network to leverage existing regional strengths and facilitate cross-border collaboration in addressing bioeconomy challenges. A formal meeting of the proposed Bioeconomy University Alliance is planned, with the aim of holding its inaugural session at the Global Bioeconomy Summit (GBS) 2026.
- Developing a Knowledge Exchange Strategy: The discussion emphasized the need for a robust framework for knowledge valorization, co-creation, and sharing. Participants highlighted the potential of fostering interdisciplinary collaboration between universities, research institutions, and industry partners to ensure innovation and real-world applications in the bioeconomy.
- Addressing Institutional Barriers: The session highlighted challenges such as differences in regulatory environments, funding constraints, and technological readiness across universities. Participants stressed the importance of creating inclusive and representative partnerships, ensuring that universities from Africa, Latin America, and Asia have equitable opportunities to contribute and benefit from global bioeconomy collaborations.

Concluding Thoughts

The workshop reinforced the growing enthusiasm among academic institutions for advancing global collaboration in the bioeconomy sector. Stakeholders agreed to work towards formalizing the Global Bioeconomy University Alliance, facilitating cross-regional cooperation, and securing policy and financial support for this initiative.

Workshop 4

Factors Impacting the Implementation of Biorefinery Technologies in the Global Economy

Organiser: Department of Science and Innovation, South Africa, in collaboration with the International Bioeconomy Forum (IBF) Biorefinery Working Group

Key Objective(s): To explore the key challenges and opportunities associated with deploying biorefinery technologies globally and to identify strategies for scaling up biorefineries in support of a sustainable circular bioeconomy.

Approach/Purpose

The workshop convened a diverse panel of experts from Denmark, South Africa, Estonia, and Canada to discuss scalable solutions that can support the transition to a bio-based economy while addressing economic, social, and environmental challenges. The discussion emphasized the need for open communication to share successes and challenges in biorefinery deployment, as well as the importance of international collaboration to ensure regulatory alignment and drive innovation.The session further highlighted the role of indigenous communities and youth in bioeconomy initiatives, recognizing that community empowerment is key to sustainable bioeconomy development. Participants discussed how biorefineries can contribute to local economic opportunities through optimized bioresource utilization and by building resilient business cases tailored to different regional contexts.

Key Results/Priorities

- Maximizing bioresource efficiency: Encouraging the better utilization of biomass resources to minimize waste and promote sustainability, ensuring that value is extracted across all stages of the biorefinery process.
- Enhancing knowledge sharing: Strengthening platforms for cross-sector learning and capacity-building, allowing stakeholders to exchange insights on technological advancements and policy frameworks.
- Strengthening public-private partnerships: Fostering collaboration between governments, industry, and academia to drive innovation and ensure the scalability of biorefinery solutions.
- De-risking early-stage research and commercialization: Securing financial incentives and investment-friendly environments to encourage the private sector to engage in biorefinery development.
- Building inclusive business models: Ensuring that biorefinery projects support community development and create economic opportunities, especially for marginalized groups and local entrepreneurs.

Concluding Thoughts

The workshop concluded with a strong call to action for stakeholders to enhance collaborative efforts in driving biorefinery development. Participants emphasized the need to accelerate the transition to greener solutions by integrating biorefineries at different scales, from rural to industrial settings, to achieve significant environmental and economic impacts. The session recommended ongoing engagement through virtual platforms and knowledge-sharing events to sustain momentum and support stakeholders in the successful implementation of biorefinery technologies.

Workshop 5

The Power of Many: Addressing Global Food System Challenges Through Innovation in a Bioeconomy Context

Organiser: Seeding The Future van Lengerich Foundation, in collaboration with Welthungerhilfe (WHH), Partners in Food Solutions (PFS), and Food Systems For the Future (FSFTF).

Key Objective(s): To explore multi-stakeholder engagement strategies for addressing global food system challenges through bioeconomy-driven innovation while ensuring equitable access to safe, nutritious, and affordable food.

Approach/Purpose

The workshop convened a diverse group of civil society organizations (CSOs), entrepreneurs, small and medium-sized enterprises (SMEs), and startups to discuss systemic food system transformation. The session emphasized the importance of engaging stakeholders across the entire food value chain—from farmers to consumers—to uncover opportunities for innovation, sustainability, and equitable access. Discussions focused on the need for strong policy interventions, long-term capital investment, and international collaboration to drive meaningful progress in food security and bioeconomy-based solutions. A pre-event session was held, where over 50 startups, innovators, and SMEs identified key challenges in food systems and formulated innovative solutions. This was followed by high-impact solution pitches from entrepreneurs and scientists, as well as a fireside chat with global food system leaders reflecting on trends in food security and bioeconomy development.

Key Results/Priorities

- Strengthening Public-Private Partnerships: Encouraging collaborations between governments, private investors, and food system actors to enhance financing opportunities and infrastructure development for bioeconomy solutions.
- Enhancing Policy and Governance Support: Local governments and policymakers must create an enabling regulatory environment that supports innovation, entrepreneurship, and equitable food access.
- Mobilizing Long-Term Capital and Impact Investments: Sustainable food systems require consistent funding, sincere impact investments, and increased government incentives to foster human-centered, sustainable growth.
- Raising Global Awareness and International Investment: The need for strategic collaborations with global partners to attract investments and learn from successful models such as China's advancements in agricultural innovation and food security initiatives.
- Scaling Up SMEs and Innovators: Supporting small and medium-sized enterprises (SMEs) in developing and scaling bioeconomy-driven food solutions to enhance local and global food security.

Concluding Thoughts

The workshop underscored the collective power of stakeholders in transforming food systems through innovation, investment, and strategic policy action. Participants emphasized that achieving food security through bioeconomy approaches requires strong international collaboration, financial commitment, and advocacy efforts. The session called for continued engagement in global partnerships, investment in research and development, and support for SMEs to ensure sustainable food system transformation.

Workshop 6

Harnessing Collective Intelligence for Bioventures Solutions in LATAM

Organiser: Inter-American Institute for Cooperation on Agriculture (IICA)

Key Objective(s): To explore the challenges and opportunities for bio-entrepreneurship in Latin America and the Caribbean (LAC) and leverage collective intelligence to identify innovative solutions that support the growth of bioventures, food security, climate resilience, and sustainable economic development.

Approach/Purpose

The workshop brought together bio-entrepreneurs, policymakers, investors, and researchers to discuss how to strengthen bioeconomy ecosystems highlighting common challenges for bio-entrepreneurship across Asia, Africa, and Latin America, including:

- Lack of training and knowledge application barriers that hinder the practical implementation of bioeconomic solutions.
- Limited access to finance preventing startups and SMEs from scaling bio-based businesses.
- Challenges in forming partnerships to develop resilient and innovative bioeconomic models.

The session emphasized the need for improved training programs to equip farmers and entrepreneurs with the skills necessary to adopt and scale bioeconomic innovations. It also addressed the complexity of coordinating stakeholders, calling for stronger collaboration mechanisms between governments, academia, and the private sector.

Key Results/Priorities

- Enhancing Global South-North Collaboration: Technology transfer, financial solutions, and triangular cooperation essential for bridging knowledge and investment gaps between developed and developing economies.
- Developing Locally Adapted Technologies: Technologies from the Global North are not always adaptable to the unique biodiversity and socio-economic conditions of the Global South. Developing localized, nature-based solutions is crucial for ensuring long-term success.
- Establishing an International Bioeconomy Fund: A fund to support SMEs and farmers in the Global South, financed through international partnerships to help overcome investment barriers and provide critical funding for innovative bioeconomic solutions.
- Leveraging High-Value Bio-Based Products and Fair Trade Practices: Participants emphasized the potential of biodiversity-driven bioventures such as bio-cosmetics, medicinal plants, and superfruits to drive local economies while ensuring fair incentives for producers.
- Strengthening Networking and Market Linkages: building networks between bio-entrepreneurs, academia, and investors for knowledge-sharing, co-innovation, and access to global markets.
- Improving Policy and Regulatory Frameworks: Participants highlighted the need for clearer, supportive policies to create an enabling environment for bioventures to thrive.
- Enhancing Impact Measurement: The importance of quantifying the socio-environmental impact of bioeconomy initiatives was emphasized to attract investors and influence policymakers.

Concluding Thoughts

The workshop concluded with a call to action for stakeholders to leverage collective intelligence, foster collaboration, and create sustainable pathways for bioventures in LAC. Participants emphasized the importance of strategic alliances, innovative financing mechanisms, and policy reforms to support the scaling of bioeconomy ventures while ensuring ecological and social sustainability. The discussions reinforced the potential of bioeconomic innovations to transform rural economies, enhance biodiversity conservation, and create inclusive economic opportunities across Latin America and beyond.

Workshop 7

Financing the Bioeconomy: African Opportunities and Challenges

Organisers: World Bioeconomy Forum, NatureFinance, and Ecosystems Finance Health

Key Objective(s): To explore bioeconomy financing mechanisms in Africa addressing challenges in accessing sustainable investments, and identify strategies to bridge the financing gap between the Global North and the Global South while aligning with international frameworks such as the G20 high-level principles.

Approach/Purpose

The workshop highlighted the massive financial potential of the bioeconomy, currently valued at $4 trillion, with projections to reach $30 trillion by 2050. Discussions examined the contrasting approaches of the Global North, which emphasizes the circular economy and clean energy, versus the Global South, which views the bioeconomy as an immediate tool for development, job creation, and improved health and food security. The session emphasized that 100% of the global economy depends on nature, making bioeconomy investments a crucial intersection of biodiversity conservation, technological advancement, and equitable economic development. Participants stressed the need for financing models that integrate social equity, sustainability, and long-term economic growth.

Key Results/Priorities

- Emerging Bioeconomy Financing Channels: The session categorized financing opportunities into three key areas: (i) Nature-Intensive Financing – Public finance, subsidies, and ecosystem services as key drivers for conservation-focused bioeconomy investments. (ii) Advanced Financing – Venture capital, development finance institutions (DFIs), and targeted subsidies to support bioeconomy initiatives at scale, and (iii) High-Tech Financing – Corporate investments and R&D incentives necessary for scaling high-value bioeconomy ventures.
- Aligning Bioeconomy Financing with Sustainable Development Goals (SDGs): Participants underscored the need for financing mechanisms to be integrated into broader sustainability strategies, ensuring that investments drive both economic growth and environmental resilience.
- South Africa's Leadership in Bioeconomy Standards and Metrics: The country was highlighted as a leader in developing bioeconomy financing standards, aligning them with G20 high-level principles to create an implementation framework that guides investments, ensures accountability, and facilitates international collaboration.
- Scaling Up SMEs and Catalytic Projects: The session highlighted SMEs' role in Africa's bioeconomy and stressed public-private partnerships PPPs, carbon markets, and impact investments as key funding strategies
- Integrating Health, Climate, and Biodiversity Outcomes in Financing Models: The workshop explored opportunities to link health and climate finance with bioeconomy investments, ensuring that funding mechanisms drive multi-sectoral impacts that contribute to climate resilience, biodiversity conservation, and sustainable economic development.

Concluding Thoughts

The workshop concluded with a strong call to action for African stakeholders to leverage global bioeconomy financing opportunities under the G20 framework and beyond. the need for increased collaboration, innovative financing mechanisms, and strategic policy support to unlock Africa's bioeconomy potential. The session emphasized the importance of catalytic projects that demonstrate tangible bioeconomy benefits, attracting more funding and fostering public-private partnerships to drive sustainable growth.

Workshop 8

Making it real – Exploring Concrete Actions and Recommendations Towards Fostering the Implementation of the African Union (AU) – European Union (EU) Innovation Agenda through Bioeconomy Collaboration

Organiser: BioInnovation Institute Foundation (BII), in collaboration with BioInnovate Africa and GrowthAfrica Foundation

Key Objective(s): To bridge the gap between the Global North and South by translating high level AU-EU bioeconomy frameworks into practical, micro-level actions that drive tangible impact.

Approach/Purpose

The workshop brought together key stakeholders, including policymakers, entrepreneurs, and investors, to explore strategies for advancing the AU-EU Innovation Agenda through bioeconomy-focused collaboration. The session emphasized the need to move beyond macro and meso frameworks to localized, practical implementation models. Participants shared real-world examples of startups, biotech initiatives, and sustainable production models that illustrate how collaboration between local and global partners can drive innovation. Since March, BioInnovate Africa and GrowthAfrica have been engaging in efforts to explore solutions for fostering deeper AU-EU cooperation in biotechnology, agriculture, and sustainable development.

Key Results/Priorities

- Partnerships: (i) Defining and strengthening AU-EU partnerships to leverage complementary strengths from both regions. (ii) Establishing structured stakeholder engagement mechanisms to enhance cross-ecosystem linkages. (iii) Creating routine engagement spaces for sustained dialogue and knowledge exchange.
- Implementation: (i) Translating strategic frameworks into concrete sector-specific initiatives at the grassroots level. (ii) Moving beyond conceptual discussions to focus on demonstrating tangible results and redefining targets based on implementation challenges. (iii) Strengthening technology transfer and capacity development to empower local actors.
- Localization: (i) Adapting the bioeconomy agenda to local contexts to make it more accessible and relevant to communities. (ii) Incorporating insights from local ecosystems into policy and project implementation to ensure practical solutions. (ii) Strengthening feedback loops and listening mechanisms to adapt initiatives to evolving needs.
- Financing: (i) Addressing fragmented and siloed funding approaches that limit the scalability of bioeconomy initiatives. (ii) Attracting local investment and tailoring financing models to fit African market realities. (iii) Encouraging corporate involvement in research and innovation to strengthen financial sustainability.

Concluding Thoughts

The workshop emphasized the urgency of intensifying AU-EU bioeconomy collaboration through cross-ecosystem exchanges, localized implementation, and sustainable financing mechanisms. Participants proposed the creation of a joint consortium of AU-EU stakeholders to develop a clear roadmap for collaboration, including capacity-building initiatives, joint ventures, and technology-sharing agreements. Enhancing stronger partnerships, securing funding, and integrating local expertise will be essential to ensuring the successful implementation of the AU-EU Innovation Agenda in the bioeconomy sector.

Breakout Session II (Day one-afternoon)

Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy

Workshop 9

AI-Powered Solutions for Pest and Disease Management in Primary Bioeconomy Production

Organiser: International Bioeconomy Forum (IBF) and ICT-AGRI ERA-NET

Key Objective(s): To explore the role of artificial intelligence (AI) in pest and disease management within primary bioeconomy production and to identify scalable AI-driven solutions that reduce reliance on chemical pesticides, enhance productivity, and support sustainable farming practices.

Approach/Purpose

The workshop convened stakeholders from research institutions, industry, and policy to examine how AI technologies can revolutionize agricultural pest and disease management by integrating diverse data sources and delivering real-time, localized advice to farmers. Presenters shared case studies from Europe and Africa, showcasing practical applications of AI in the bioeconomy sector.

A key theme of the discussion was the emergence of a new ecosystem of entrepreneurs, particularly young women, who are developing AI-powered agricultural solutions to enhance pest and disease control. However, advancing AI-based automated pest and disease recognition remains a major challenge due to the need for extensive model training, robust datasets, and localized adaptations. Participants stressed the principle that "no AI without data, no data without trust" should guide AI development in the bioeconomy sector.

Key Results/Priorities

- Building Region-Specific AI Models: AI applications require high-quality, localized datasets to improve model accuracy and effectiveness. Developing trust in data-sharing mechanisms is critical to ensure reliable AI solutions.
- Fostering Entrepreneurship in AI-Driven Agriculture: The widespread availability of AI tools is driving innovation and entrepreneurship, with women-led startups playing a prominent role in developing AI-powered agricultural solutions.
- Strengthening AI Collaboration Networks: The workshop facilitated the establishment of new collaborations between Kenya and Colombia to further develop innovative AI-based pest and disease management solutions.
- Scaling AI Adoption Through Investment in Infrastructure: Participants emphasized the importance of investing in digital infrastructure, training programs, and capacity-building initiatives to support AI adoption among smallholder farmers.
- Ensuring Cost-Effectiveness and Value Addition: AI-driven solutions must be integrated across the entire agricultural value chain to improve efficiency, lower costs, and ensure widespread adoption by farmers.
- Policy Support and Regulation: The workshop highlighted the need for strong policy frameworks to support the responsible deployment of AI technologies in agriculture, ensuring accessibility and affordability for farmers in developing regions.

Concluding Thoughts

The workshop concluded with a call to action for increased investment in AI-driven agricultural solutions, stronger public-private partnerships, and policies that promote equitable access to AI innovations. Discussions reaffirmed that AI, when effectively deployed, has the potential to transform agriculture, reduce chemical inputs, enhance resilience, and drive sustainable bioeconomic growth globally.

Workshop 10

The Significance of Water in Bioeconomy Strategies

Organiser: Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB)

Key Objective(s): To examine the critical role of water in bioeconomy strategies across urban, rural, and industrial contexts, and to identify strategic approaches for integrating water management into sustainable bioeconomic development.

Approach/Purpose

The workshop brought together stakeholders from science, policy, industry, and finance to discuss the growing challenges of water scarcity, pollution, and excess water-related damages such as flooding. Given water's fundamental role in agriculture, forestry, energy production, biotechnology, and industrial processes, participants emphasized the need for strategic water management to unlock the full potential of the bioeconomy.

Keynote presentations showcased successful bioeconomy approaches related to water management while highlighting challenges faced by African countries, particularly regional variations in water availability and the need for transboundary water governance. The workshop underscored the water-energy-food nexus as central to ensuring sustainable and efficient resource utilization.

Key Results/Priorities

- Regional water resource management: Given the significant variation in water resources across Africa, participants emphasized the need for regionally adaptive water strategies that transcend national borders and integrate environmental, economic, and social considerations.
- Wastewater and nutrient recovery: The session highlighted the importance of wastewater management, industrial water reuse, and nutrient recovery as key bioeconomic strategies that can close resource loops and reduce environmental impacts.
- Governance and policy integration: A major challenge identified was the lack of integrated water policies and governance frameworks, which has led to fragmented management approaches and inefficiencies in water use.
- Access to data and technology: Limited access to real-time data and technologies for efficient water utilization and wastewater treatment remains a critical barrier in developing regions.
- Capacity Building and Knowledge Sharing: The need for education, training, and cross-sector collaboration was emphasized as crucial for improving water management practices in bioeconomy sectors.
- Financing and investment barriers: Participants identified funding constraints as a key challenge, limiting the implementation of innovative water solutions in bioeconomy sectors.

Concluding Thoughts

The workshop concluded with a call for enhanced collaboration among stakeholders to develop regionally adaptive water strategies within the bioeconomy. Participants highlighted successful practices such as cross-sector partnerships, innovative financing mechanisms, and the application of advanced technologies for water monitoring and reuse. As a follow-up, Fraunhofer IGB announced plans to organize a virtual workshop to translate workshop insights into actionable strategies and foster knowledge-sharing, innovation, and capacity-building. The session reinforced that water is not just a resource but a key enabler of sustainable bioeconomic development and that addressing water challenges is essential for achieving climate adaptation, biodiversity conservation, and food security.

Workshop 11

Sustainable Bioenergy-Biochar Systems and Circular Bioeconomy

Organiser: CIFOR-ICRAF, in collaboration with the French National Research Institute for Sustainable Development (IRD), the University of Manchester, and the Swedish University of Agricultural Sciences (SLU).

Key Objective(s): To explore the role of bioenergy and biochar systems in advancing a sustainable circular bioeconomy, while identifying key sustainability pillars, policy considerations, and commercialization pathways.

Approach/Purpose

The workshop with stakeholders from research institutions, industry, and policy sector facilitated knowledge sharing and capacity building on sustainable bioenergy and biochar, highlighting their contributions to climate action, biodiversity, soil health, and social inclusion. Biochar, a carbon-rich byproduct of bioenergy production with multifunctional applications and with broad potential within the circular bioeconomy in areas of soil health improvement, carbon sequestering, animal feed supplementation, and wastewater treatment. The discussions emphasized the need for environmentally sound production, efficient utilization, and supportive policies and market incentives to scale biochar-based solutions effectively. The session also addressed policy and governance challenges, emphasizing the need for stronger policy advocacy to support bioenergy-biochar initiatives and unlock investment opportunities. Additional discussions explored bioenergy-biochar innovations, including agroforestry-based biochar production, combined heat and power (CHP) systems, and biomass energy cooking technologies that generate biochar as a byproduct

Key Results/Priorities

- Sustainable biomass sourcing and production: The importance of responsible biomass sourcing and adherence to environmental and social sustainability standards in biochar production. Discussions covered biomass availability, quality, and socio-economic impacts, ensuring sustainability across the value chain.
- Capacity development and awareness raising: The adoption and scaling of bioenergy-biochar systems require comprehensive training and awareness programs targeting farmers, researchers, policymakers, and entrepreneurs. Building technical expertise and fostering knowledge-sharing platforms were recommended as essential steps for broader uptake.
- Commercialization and market development: Viable business models for biochar commercialization need to be established including market segmentation, pricing strategies, and value addition to improve the economic viability of biochar products and create sustainable income opportunities for smallholder farmers and entrepreneurs.
- Developing standardized policies and technical regulations is essential for guiding biochar production, usage, and certification. Establishing robust regulatory frameworks enhances credibility, effectiveness, and market entry. Participants emphasized the need to integrate biochar systems into national climate and energy strategies to improve policy alignment and attract public-private partnership.

Concluding Thoughts

The workshop underscored the critical role of sustainable bioenergy-biochar systems in driving a circular bioeconomy. The four identified pillars—sustainable production, capacity development, commercialization, and standardization—form the foundation for advancing this agenda. Stakeholders were encouraged to collaborate in scaling these innovations, ensuring they contribute to environmental conservation, economic resilience, and social well-being across Africa and beyond.

Workshop 12

Availability of and Competition for Biomass in the Bioeconomy (icipe/ University of Bonn)

Organiser: International Centre of Insect Physiology and Ecology (icipe) and the Centre for Development Research (ZEF), University of Bonn

Key Objective(s): To examine the availability and competing uses of biomass in the bioeconomy, assess supply and demand dynamics, and identify challenges and opportunities for sustainable biomass utilization.

Approach/Purpose

The workshop convened experts from the Global South to explore biomass supply and demand across eight country case studies (Burundi, Colombia, Ghana, India, Kenya, Namibia, South Africa, and Uganda). These case studies provided insights into the unique biomass potentials and constraints across different regions, highlighting barriers to sustainable biomass utilization. A major challenge identified was the critical lack of data on biomass resources, including location, size, and competing applications. Participants emphasized that the absence of comprehensive data hinders informed decision-making, effective policies, and investment strategies. The workshop also highlighted fragmented efforts in biomass utilization, stressing the need for greater coordination and knowledge-sharing among stakeholders.

Key Results/Priorities

- Data Gaps and the Need for Comprehensive Research: There is a lack of reliable data on biomass supply, quality classification, and competing applications. The limited number of case studies makes it difficult to generalize findings, necessitating more systematic and region-specific research.
- Competing Uses of Biomass: Participants emphasized the challenge of balancing biomass utilization across industrial, agricultural, and ecological demands. The feasibility of biomass processing technologies remains in its early stages, requiring further investment in research and development.
- Strategic Planning and Policy Coordination: There is an urgent need for integrated biomass management strategies that align with national bioeconomy policies and foster public-private collaboration. Holistic policy frameworks should guide biomass utilization while balancing economic, social, and environmental priorities.
- Investment in Innovation and Market-Driven Solutions: To unlock biomass potential, there must be greater investment in resource efficient biomass valorization technologies and market-driven solutions that enhance sustainability and economic viability. Participants recommended knowledge-sharing platforms and cross-sector collaboration to support sustainable biomass-based industries.

Concluding Thoughts

The workshop reinforced that biomass is a critical resource for the bioeconomy, but its potential remains underutilized due to data gaps, fragmented policies, and limited technological advancements. Stakeholders emphasized the importance of comprehensive data collection, cross-sector collaboration, and strategic investments to ensure sustainable biomass utilization. Participants called for the development of an evidence-based framework to guide biomass policy formulation, enhance resource efficiency, and promote bioeconomic growth.

Workshop 13

Healthy Soils: An essential Prerequisite for Sustainable Bioeconomy

Organiser: Eco-Environment Innovation GmbH and the Art and Nature Foundation Nantesbuch

Key Objective(s): To highlight the critical role of soil health in ensuring the sustainable provision of bioresources, advancing bioeconomy strategies, and fostering resilience against climate change and biodiversity loss.

Approach/Purpose

The workshop brought together experts from soil science, agriculture, policy, and environmental conservation to discuss the state of global soil health, emerging research, and practical solutions for sustainable soil management. Participants examined the ongoing challenges of soil degradation, exacerbated by climate change, biodiversity loss, and rising natural resource demand. A key focus was on advances in microbiome research, showcasing the interactions between soil microbiota, plant health, and human nutrition. Participants emphasized that a deeper societal understanding of soil health—particularly through its connection to food consumption—can open new bioeconomic opportunities and encourage widespread adoption of sustainable land management practices.

Key Results/Priorities

- Agroforestry mixed cropping, silvopastoral practices and regenerative practices play a crucial role in maintaining soil fertility, enhancing biodiversity, increasing carbon sequestration and improving resilience to environmental stresses.
- The biodiversity continuum was emphasized, reinforcing that above-ground biodiversity cannot thrive without a healthy below-ground ecosystem. Soil biodiversity and soil microorganisms drive nutrient cycling, carbon storage, and ecosystem health, making their protection vital for sustainability
- Integrating soil health into bioeconomy strategies is key to sustainability. Despite advances in soil management, degradation persists, requiring regenerative agriculture to be embedded in bioeconomy policies to maintain soil productivity and resilience.
- Raising public awareness and educating communities are crucial for fostering a societal shift toward valuing soil health and can encourage individuals, businesses, and policymakers to adopt sustainable soil management practices.
- Targeted policy interventions, incentives, financial mechanisms and technical assistance are required to support and reward farmers in adopting sustainable soil management practices.
- Investment in research and development is critical for scaling up innovations in soil microbiome science and agroforestry. Strengthening collaboration between conventional and regenerative soil management approaches can provide scientific and practical solutions to soil degradation.

Concluding Thoughts

The workshop reinforced that healthy soils are a fundamental prerequisite for a thriving and sustainable bioeconomy. Protecting and enhancing soil health is essential not only for food security but also for climate resilience, biodiversity conservation, and economic development. Participants emphasized the need for cross-sector collaboration, innovative policy frameworks, and sustained investment in soil health to ensure a bioeconomy that is both resilient and regenerative. Moving forward, efforts must focus on integrating soil health strategies into national and global bioeconomy agendas, ensuring that soil conservation remains a priority for sustainable development.

Workshop 14

Let's Create a Future-Ready bioeconomy: Innovative, Inclusive and Sustainable!

Organiser: EU Bioeconomy Youth Ambassadors

Key Objective(s): To foster collaboration, innovation, and inclusivity in the bioeconomy by engaging youth participants in entrepreneurial challenges that address pressing sustainability issues and develop viable bioeconomy solutions.

Approach/Purpose

The workshop convened participants from diverse backgrounds, who were divided into 10 teams to develop and pitch entrepreneurial bioeconomy solutions across different sectors, including fisheries, aquaculture, regenerative agriculture, and food systems. Each team worked on structured business model development, risk management, and sustainability integration across environmental, economic, and social dimensions. Participants presented three-minute pitches to a panel of judges, showcasing their innovative bioeconomy solutions. The session was designed to promote inclusivity, ensuring a mix of gender and geographical representation, and incorporated interactive elements such as "wild card" twists and storytelling exercises to stimulate creativity and engagement.

Key Results/Priorities

- High levels of creativity and innovation were displayed, with participants successfully developing structured and impactful business models despite the limited timeframe.
- The winning team focused on bio-based agriculture, demonstrating a strong alignment with sustainable bioeconomy objectives. Their concept emphasized job creation, environmental conservation, and economic resilience, positioning their idea as a model for future bioeconomy initiatives.
- Challenges faced by aspiring bio-entrepreneurs were identified, including:
    - Limited access to funding and investment opportunities to scale bio-based solutions.
    - Difficulties in balancing environmental, economic, and social sustainability within bioeconomy business models.
    - Regulatory and policy barriers that vary across regions, making it difficult for startups to navigate compliance requirements.
- The workshop emphasized the importance of building collaborative networks, mentorship programs, and knowledge-sharing platforms to support young bio-entrepreneurs in transforming their ideas into viable business solutions.
- Continued engagement through post-workshop initiatives was encouraged, ensuring participants receive ongoing support and industry connections to refine and scale their projects.

Concluding Thoughts

The workshop successfully provided a platform for youth-driven innovation in the bioeconomy sector, demonstrating the potential of young changemakers to shape a sustainable and inclusive future. The EU Bioeconomy Youth Ambassadors plan to build on this momentum by supporting the participating teams in developing their ideas further and connecting them with relevant stakeholders to foster long-term impact. The session reinforced the message that the future of the bioeconomy lies in the hands of young, innovative, and passionate individuals who can drive meaningful change through entrepreneurship and collaboration.

Workshop 15

Private–Public Cooperation in the Bioeconomy as a Driver for (re)– Industrialisation

Organiser: Bio-based Industries Consortium (BIC)

Key Objective(s): To explore the role of public-private partnerships (PPPs) in driving industrial transformation through the bioeconomy, examining successful models of cooperation and developing scalable blueprints that can be adapted at regional, national, and global levels.

Approach/Purpose

The workshop convened key stakeholders from government, industry, and research institutions to examine how public-private collaboration can accelerate the transition from fossil-based to bio-based industrial ecosystems. The session showcased six models of cooperation from different regions, providing valuable insights into governance structures, strategic focus areas, and financing mechanisms. The breakout group discussions, facilitated under the "World Café" format, focused on identifying best practices, challenges, and opportunities in scaling private-public cooperation across diverse economic and regulatory environments.

Key Results/Priorities

- Public-private cooperation is a critical driver for (re)-industrialization, enabling the creation of bio-based industrial ecosystems that support economic growth and sustainability.
- Six successful case studies from Africa, Europe, Latin America, and Asia provided blueprints for effective collaboration models, emphasizing governance, strategic alignment, and investment frameworks.
- Scaling partnerships require standardized blueprints that can be adapted to different regional contexts, ensuring flexibility while maintaining core principles of collaboration.
- Governance structures must be well-defined, clarifying the roles of government agencies, industry players, research institutions, and civil society in bioeconomy partnerships.
- Strategic alignment of goals between the public and private sectors is essential to ensure that bioeconomy initiatives align with national development objectives, industrial policies, and sustainability targets.
- Diversified and sustainable financing models are necessary to de-risk bioeconomy investments and encourage long-term private sector engagement. Discussions emphasized the need for innovative funding mechanisms, including public subsidies, venture capital, blended finance, and carbon market incentives.
- Ongoing stakeholder engagement is key to refining private-public collaboration models, ensuring that they remain relevant, scalable, and impactful.

Concluding Thoughts

The workshop reinforced that public-private cooperation is fundamental to advancing bioeconomy-led industrial transformation. Developing globally recognized blueprints for partnerships will be essential in scaling bioeconomy initiatives effectively and fostering economic growth, sustainability, and innovation. The follow-up activities will focus on further refining these blueprints, ensuring they provide actionable strategies for governments, industry leaders, and researchers to strengthen collaboration and accelerate the bio-based transition.

Workshop 16

The Contribution of Forest Products to the Sustainable Bioeconomy in Africa –Trends, Challenges and Opportunities

Organiser: Food and Agriculture Organization of the United Nations (FAO), in collaboration with the African Forest Forum (AFF), Climate Smart Forest Economy Program (CSFEP)/ Dalberg Catalyst, International Sustainable Forestry Coalition (ISFC), Farm Forestry Smallholder Producers Association of Kenya (FF-SPAK), Gatsby Africa, and the International Bamboo and Rattan Organization (INBAR).

Key Objective(s): To explore how Africa can advance its bioeconomy through the sustainable use of forest resources while addressing economic, environmental, and social challenges.

Approach/Purpose

The workshop brought together international organizations, foundations, and private sector acors on hoe forests and forest products contribute to Africa's sustainable bioeconomy. The session also served as a platform to present the FAO and Dalberg Catalyst report titled *"Building a Sustainable Bioeconomy in Africa Through Forest Products – Trends, Opportunities, and Challenges."* with case studies from Gabon, Ghana, South Africa, and Tanzania.

Key Results/Priorities

- Forest product value chains (timber, NWFPs, ecotourism) offer opportunities for a sustainable bioeconomy with value-added products reducing waste and boosting economic benefits.
- Africa's high deforestation rate is driven by agriculture, population growth, and woodfuel reliance. Responsible harvesting, land tenure clarity, and better forest management are crucial, but data gaps hinder effective resource management.
- Enabling policies and incentives can attract investment and support sustainable forest enterprises.
- Community-centered development ensures inclusivity. Gender equity, youth participation, and capacity-building programs empower smallholders and forest-dependent communities.
- Bamboo's potential in construction, furniture, and energy remains underutilized. Policy support and market incentives are needed for wider adoption across Africa.

Recommendations for Advancing the Forest-Based Bioeconomy:

- Develop sustainable plantations to meet Africa's growing demand for forest products while conserving natural forests.
- Strengthen forest product processing and manufacturing capacity to reduce raw material exports and increase value addition Invest in new technologies/data-driven solutions to enhance forest management and productivity.
- Support smallholder producers in accessing national and international markets through certification and value chain development.
- Implement policies that support forest conservation, biodiversity protection, and climate resilience.

Concluding Thoughts

The workshop underscored the critical role of forests and forest products in Africa's transition to a sustainable bioeconomy. It highlighted the need for collaboration among stakeholders, data-driven policymaking, and inclusive approaches to ensure that forests continue to provide economic, environmental, and social benefits. Moving forward, governments, private sector actors, and development organizations must work together to implement sustainable forest management strategies that balance economic growth with ecological preservation.

Breakout Session III (Day two-Morning)

Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy

Workshop 17

Connecting Young Changemakers and Thought Leaders to Shape a Sustainable Future

Organiser: Bioeconomy Youth Champions of the International Advisory Council on Global Bioeconomy (IACGB)

Key Objective(s): To unite young professionals and thought leaders from across the world to collaborate on shaping a sustainable bioeconomy future, foster networking opportunities, and showcase youth-driven innovations and best practices in the bioeconomy sector.

Approach/Purpose

The workshop provided a platform for youth-led discussions, bringing together young professionals from diverse backgrounds to share insights on a range of bioeconomy-related themes, The session featured keynote presentations delivered both in-person and via pre-recorded videos by youth organization leaders from different regions.

Key Results/Priorities

- To enhance inclusivity, a virtual follow-up event was proposed to engage youth organizations that faced financial and logistical barriers to attending the Nairobi workshop
- Limited access to training and mentorship remains a key barrier, preventing many young professionals from fully engaging in bioeconomy initiatives. There is a need for structured capacity-building programs that provide technical knowledge and practical experience.
- Young changemakers face difficulties in applying knowledge to specific regional contexts, highlighting the need for localized strategies and solutions that consider unique environmental, economic, and cultural conditions.
- Barriers to finance and resources continue to restrict the growth and scalability of youth-led bioeconomic ventures. Strengthening financial access mechanisms and investment opportunities for youth-driven projects is critical to overcoming this challenge.
- Challenges in forming strategic partnerships hinder youth participation in policy and decision-making processes. The workshop emphasized the importance of building stronger linkages between youth organizations, governments, research institutions, and private sector stakeholders to enable collaboration and knowledge exchange.
- The discussion also explored collaborative approaches between the Global South and North, emphasizing technology transfer, financial solutions, fair trade practices, and triangular cooperation to create mutually beneficial opportunities.

Key Recommendations:

- Establish a global youth bioeconomy network to facilitate ongoing collaboration and knowledge exchange among young professionals and industry leaders.
- Enhance capacity-building programs to equip youth with the necessary skills, mentorship, and resources to engage meaningfully in the bioeconomy.
- Advocate for increased investment and institutional support from governments, international organizations, and the private sector to empower youth-driven bioeconomy initiatives.

Concluding Thoughts

The workshop emphasized the importance of engaging youth as active contributors to the bioeconomy and the need for continuous dialogue, collaboration, and investment in youth-led initiatives. The planned virtual follow-up event will build on the momentum generated during the session, ensuring that young changemakers continue to play a central role in shaping a sustainable and inclusive bioeconomy future.

Workshop 18

Leveraging the Nexus of Biodiversity Informatics and Bioeconomy to Improve Rural and Urban Livelihoods

Organiser: International Centre of Insect Physiology and Ecology (icipe)

Key Objective(s): To explore how biodiversity informatics can be integrated into the bioeconomy to support agrobiodiversity, regenerative agriculture, and indigenous knowledge, with a focus on improving rural and urban livelihoods.

Approach/Purpose

The workshop brought together multidisciplinary experts from the Global South and Africa, representing bioresource management, environmental science, conservation biology, entomology, climate finance, and public health. Discussions centered on the role of biodiversity informatics in shaping sustainable bioeconomic transformation and the need to integrate indigenous knowledge with scientific data to drive community-led solutions.

Key Results/Priorities

- Biodiversity informatics can drive bioeconomic growth by providing scientific evidence to inform policy, guide sustainable practices, and support decision-making in conservation and resource management.
- Integrating indigenous knowledge with scientific data is essential to ensuring community engagement and inclusivity in bioeconomy initiatives. Shared social and economic benefits, as well as land and resource management rights for indigenous communities, must be protected through policy interventions and inclusive action plans.
- Capacity building among indigenous communities and national stakeholders is needed to enhance their understanding and application of biodiversity informatics within bioeconomy frameworks.
- Investment mobilization through public-private partnerships, collaboration, and market linkages is crucial for ensuring the sustainability and scalability of bioeconomy initiatives. Creating a conducive environment for investment can support the development of biodiversity-based enterprises and value chains.
- Case studies from across Africa demonstrated how biodiversity-driven bioeconomy strategies can create economic opportunities while promoting environmental sustainability. These examples reinforced the importance of locally adapted solutions and data-driven approaches.

Concluding Thoughts

The workshop reinforced that biodiversity informatics must be prioritized in bioeconomic strategies and policies to ensure long-term sustainability. Developing structured frameworks for data collection, sharing, and application is critical to closing existing knowledge gaps and fostering evidence-based decision-making. The integration of biodiversity informatics with indigenous knowledge systems was identified as a key enabler for resilient community-led solutions.

Workshop 19

Metrics and Technical Standards to Monitor the Economic Contribution and Sustainability of the Bioeconomy and Foster Innovation

Organiser: United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC), in collaboration with the Food and Agriculture Organization (FAO), the Stockholm Environment Institute (SEI), the Engineering Biology Research Consortium (EBRC), and Imperial College, London.

Key Objective(s): To explore measurement frameworks and technical standards for advancing a sustainable and inclusive bioeconomy, addressing gaps in national accounting frameworks, and fostering innovation in bioengineering, biology, and biotechnologies.

Approach/Purpose

The workshop addressed the urgent need for robust bioeconomy measurement frameworks by examining three key levels of assessment: macroeconomic frameworks, sustainability indicators, and technical standards. Discussions highlighted the limitations of GDP-based national accounting systems in capturing environmental and social welfare considerations, underscoring the importance of reliable, transparent data sources to enable meaningful comparisons across national, regional, and local levels.

Key Results/Priorities

- Satellite accounts within national accounting systems provide a foundation for estimating the economic contribution of the bioeconomy. However, participants stressed that these systems have limitations in capturing environmental impacts and social welfare considerations.
- Reliable and transparent data sources are essential for effectively measuring bioeconomy strategies and progress. Participants emphasized the necessity of global bioeconomy metrics to monitor and compare developments across different regions.
- Environmental and social sustainability criteria should be adaptable from national policy goals to local and community levels to ensure practical application and inclusivity in bioeconomy initiatives.
- Technical standards for data management, sustainability assessments, and biomass feedstock use are crucial to facilitating industry partnerships and enabling the commercialization of bio-based solutions.
- Aligning bioeconomy technical standards with G20 principles is necessary to ensure coherence, facilitate cross-border collaboration, and drive international investments in bioeconomy sectors.

Concluding Thoughts

The workshop reinforced the importance of continued stakeholder engagement in developing actionable measurement frameworks that integrate these recommendations into national and regional bioeconomy strategies. Participants recognized the need to map existing bioeconomy measurement initiatives to effectively support both global and local bioeconomy development goals.

Workshop 20

Feedstocks for New Value Chains, Unlocking Full Potential of Crop Residues and Food Processing Side-Streams

Organiser: LL-BioEconomy, Research & Advisory, in collaboration with Beamcircular and the Danish Technological Institute.

Key Objective(s): To explore opportunities for valorizing agricultural residues and food processing side-streams to create new economic value, support rural livelihoods, reduce raw material exports, and enhance sustainability within the global bioeconomy.

Approach/Purpose

The workshop positioned the bioeconomy as a key solution to pressing global challenges, including climate change, biodiversity loss, food security, and gender equity. The session featured five distinguished speakers from five continents, representing Ghana, Thailand, the USA, Tanzania, and Denmark. Discussions centered on enhancing local value addition, promoting knowledge sharing, and fostering cross-continental collaboration to unlock the potential of crop residues and food processing side-streams. A key focus was the role of young scientists and international partnerships in driving innovation and technology transfer, particularly in the Global South. The session also examined the barriers to effective utilization of agricultural residues, including limited infrastructure, restricted market access, and knowledge gaps.

Key Results/Priorities

- The bioeconomy must be positioned within the global climate change and biodiversity agenda to maximize its potential in addressing food security, sustainability, and economic resilience.
- Reducing raw material exports and prioritizing local value addition can create jobs, strengthen rural economies, and enhance the resilience of agricultural systems.
- Young researchers and scientists play a critical role in bioeconomy innovation. International collaboration and technology transfer mechanisms must be strengthened to support research and capacity-building in the Global South.
- Cross-continental collaboration is essential for scaling proven solutions and sharing best practices in biomass valorization and food processing innovation.
- Challenges such as limited infrastructure, market barriers, and knowledge gaps hinder the full utilization of agricultural residues and food processing side-streams. Addressing these requires investment in research, policy support, and private sector engagement.
- A global knowledge-sharing platform was proposed to facilitate networking, access to technical expertise, and policy alignment. This platform aims to accelerate collaboration and enable immediate action in the bioeconomy sector.

Concluding Thoughts

The workshop underscored the urgency of international cooperation to unlock the potential of crop residues and food processing side-streams in building sustainable bioeconomy value chains. A coordinated effort across governments, industries, and research institutions is required to scale innovative solutions and ensure long-term economic and environmental benefits. Participants were encouraged to continue dialogue and implement strategies that support sustainable biomass valorization within their respective regions. The proposed knowledge-sharing platform is expected to serve as a catalyst for global collaboration and drive concrete actions toward a more circular and resource-efficient bioeconomy.

Workshop 21

Will Small-Scale African farmers be Active Participants in the Worldwide Circular Bio-Economy by 2044

Organiser: DIVAGRI Project, funded by the European Union's Horizon 2020 Research and Innovation Program.

Key Objective(s): To explore the opportunities and challenges facing small-scale African farmers in becoming active participants in the global circular bioeconomy by 2044 and to identify strategies for empowering farmers through innovation, collaboration, and market-driven solutions.

Approach/Purpose

The workshop convened stakeholders from Ghana, Mozambique, South Africa, Botswana, and Kenya examining how smallholders can integrate biobased solutions into their agricultural practices. Discussions focused on participatory action research and farmer-researcher collaboration to ensure that bioeconomy technologies are both scientifically sound and practical for smallholder adoption. A major theme was the importance of aligning research with the needs of farmers and ensuring that biobased technologies, such as biochar, mobile biorefineries, and desalination greenhouses, are accessible and beneficial to rural communities. The session also explored innovative bio-based technologies currently being trialed under the DIVAGRI project.

Key Results/Priorities

- Stronger researcher-farmer collaboration through participatory action research methodologies is key to address food security challenges and ensure that agricultural research is aligned with farmers' needs.
- Market research is crucial for informed farming investments, ensuring demand-driven decisions and innovative marketing strategies.
- Collaboration among farmers, researchers, and extension officers is crucial for improving productivity and fostering the growth of the bioeconomy in rural areas.
- Small-scale farmers face several key barriers in integrating into the bioeconomy, including: (i)Limited access to capital and infrastructure constraining the adoption of bio-based technologies (ii) Insufficient local expertise, making it difficult for farmers to effectively utilize bio-based solutions, and (iii) Export barriers, which restrict access to international markets for bio-based agricultural products.
- Clear and effective communication channels are needed to disseminate bioeconomy opportunities and technologies to small-scale farmers. Accessible information and practical demonstrations are essential to fostering the acceptance and adoption of circular bioeconomy principles.
- Several innovative bio-based technologies currently being trialed under the DIVAGRI project were highlighted as potential solutions for smallholder farmers, including: Self-regulating low-energy irrigation systems, biochar production, constructed wetlands for natural water treatment, ethnobotanical intercropping for biodiversity-friendly farming and biogas systems to provide renewable energy for rural households.

Concluding Thoughts

The workshop reinforced the importance of partnerships and knowledge exchange in supporting small-scale farmers' transition to sustainable agricultural practices within the bioeconomy. Addressing barriers to capital, infrastructure, and expertise is essential to ensuring smallholder farmers play an active role in the global circular bioeconomy by 2044. Participants emphasized the need for continued collaboration, investment in farmer training, and the expansion of bio-based technologies to enhance the resilience and competitiveness of smallholder agriculture.

Workshop 22

Building Sustainable and Inclusive Forest-Based Bioeconomy Value Chains and Business Models Globally

Organiser: International Bioeconomy Forum (IBF), Working Group on Forestry

Key Objective(s): To explore successful strategies and opportunities for scaling forest based bioeconomy value chains while ensuring environmental sustainability, circularity, and economic viability. The workshop focused on enhancing social inclusivity, particularly the participation of women and indigenous communities, and data-driven decision-making and investment planning.

Approach/Purpose

The workshop examined five case studies from countries across four continents, with insights from experts representing Finland, Chad, Thailand and Laos, Canada, South Africa, and Brazil. The session emphasized the importance of inclusive business models, improved data collection, and multi-stakeholder collaboration to enhance the adoption and impact of forest-based bioeconomy models. Participants explored governance challenges, investment needs, and capacity-building strategies required to scale successful initiatives in different regions.

Key Results/Priorities

- Forest-based bioeconomy business models must prioritize sustainability, circularity, and economic viability to ensure long-term success and resilience.
- Social inclusivity is essential for the success of bioeconomy initiatives. Active participation of women and Indigenous communities enhances equitable economic opportunities and strengthens community ownership of forest resources.
- Improved data collection is critical for influencing policymakers and securing financing for scaling forest-based bioeconomy initiatives. Reliable and comprehensive data on forest resources, production processes, and market trends is necessary for informed decision-making and investment planning.
- Public stakeholder engagement is key to fostering collaboration between governments, industry, and local communities. Strengthening policy coherence and governance structures will enhance the adoption and impact of forest-based bioeconomy models.
- Key challenges remain, including: (i)Resource management and governance issues in regions with fragmented policy frameworks. (ii) Scaling successful initiatives, which requires tailored financial models and investments. (iii) Knowledge sharing and capacity building, ensuring that communities and businesses are empowered to adopt sustainable forest-based practices.
- An international bioeconomy partnership for exchange of best practices and innovative approaches to forest-based bioeconomy development was proposed, with a focus on young researchers, knowledge sharing, and technology transfer, particularly in the Global South.
- A knowledge-sharing platform with a dedicated website was also proposed to foster global collaboration, resource access, and solution co-development.

Concluding Thoughts

The workshop reinforced that multi-stakeholder collaboration, targeted investments, and strong policy support are crucial to unlocking the full potential of forest-based bioeconomy value chains. Moving forward, governments, industries, research institutions, and local communities must work together to develop inclusive business models, strengthen governance frameworks, and enhance knowledge-sharing mechanisms. The proposed international partnership and knowledge-sharing platform will play a key role in accelerating progress toward a sustainable and inclusive forest-based bioeconomy.

Workshop 23

Ready for Takeoff: Empowering Africa's Workforce for the Bioeconomy

Organiser: The Roundtable on Sustainable Biomaterials (RSB)

Key Objective(s): To explore strategies for equipping Africa's workforce with the necessary skills and competencies to drive the transition to a sustainable bioeconomy, ensuring that education and training programs align with industry needs and sustainability goals.

Approach/Purpose

The workshop brought together key stakeholders, including policymakers, academic institutions, industry representatives, and development partners, to discuss the opportunities and challenges associated with workforce development in the bioeconomy sector. A central theme was that sustainability is a non-negotiable requirement for building a resilient and inclusive bioeconomy that prioritizes both environmental and social sustainability to ensure long-term success.

Key Results/Priorities

- Upskilling Africa's workforce requires embedding sustainability fluency into education systems, ensuring that training programs focus on practical, hands-on skills aligned with the realities of the bioeconomy and the demands of the global market.
- Collaboration between policymakers and academic institutions is critical to ensuring that workforce development aligns with bioeconomic goals. Tailored curricula must reflect industry needs and emerging bio-based technologies, while also ensuring inclusivity and accessibility for youth and marginalized groups.
- Political buy-in is essential for unlocking financing and driving development in the bioeconomy sector. Participants noted that policy often takes precedence over science in ensuring progress, emphasizing the need for coherent and forward-thinking policy frameworks that support workforce development.
- The transition to a bioeconomy could generate over 16 million jobs by 2050, with approximately 6 million in the renewable energy sector. Preparing Africa's workforce for these opportunities requires stronger partnerships between academia, industry, and government agencies to co-create knowledge and implement effective capacity-building programs.
- Fostering partnerships to build a sustainable circular bioeconomy is essential. Knowledge co-creation and industry-academia collaboration were identified as key drivers of innovation and skills development in the bioeconomy sector.
- RSB's sustainability frameworks provide valuable guidance for countries looking to transition towards a bioeconomy while ensuring environmental and social responsibility.

Concluding Thoughts

The workshop reinforced the need for sustainability-driven education, policy alignment, and cross-sector collaboration to achieve a just and inclusive transition to Africa's bioeconomy. Participants called for governments, educational institutions, and the private sector to integrate sustainability principles, enhance skills development programs, and align policies with emerging bioeconomic opportunities.

Workshop24

Regionalisation of Bioeconomy: Nested Approaches from Global Targets to Local Implementation

Organiser: Forschungszentrum Jülich, Germany, in collaboration with BIOTEC (Thailand), IICA (Inter-American Institute for Cooperation on Agriculture), the Policy Action Initiative (Kenya), and the Stockholm Environment Institute (SEI).

Key Objective(s): To explore how global bioeconomy strategies can be effectively translated into regional and local implementation, ensuring that macro, meso, and micro-level approaches are integrated to drive sustainable bioeconomy transitions.

Approach/Purpose

The workshop emphasized a nested approach to bioeconomy implementation, where global aspirations are aligned with local realities through a structured framework. The session was guided by renowned experts, including Prof. Ulrich Schurr, Dr. Heike Slusarczyk, Prof. Sandra Venghaus, Dr. Denise Gider, and Dr. Christian Klar, who provided insights on bioeconomy transitions at different implementation levels. Discussions examined the roles of three interconnected levels of implementation:

- Macro level: Provides the overarching framework, strategic vision, and roadmap for bioeconomy development.
- Meso level: Bridges policy and practice, translating strategies into actionable measures such as financing, standardization, and regulatory frameworks.
- Micro level: Focuses on local implementation, identifying regional opportunities, addressing challenges, and ensuring community-level engagement in bioeconomy projects.

Key Results/Priorities

- Successful bioeconomy transitions require a well-coordinated interplay between macro, meso, and micro levels. Each level serves a distinct yet interconnected function that supports the overall bioeconomy framework.
- Mutual learning across scales is essential. Stakeholders should facilitate dialogue, share experiences, and exchange best practices to accelerate bioeconomy transitions.
- Synergies across different regions should be valorized. The workshop emphasized the importance of leveraging regional strengths and aligning with global sustainability goals to maximize impact.
- Financing and policy support at the meso level are critical. Effective public-private partnerships, standardization, and investment models will ensure that bioeconomy strategies are successfully implemented at regional and local levels.
- Local implementation strategies should be adaptive and community-driven. Bioeconomy solutions must be tailored to local contexts, identifying site-specific opportunities and ensuring that stakeholders at all levels are actively involved.

Concluding Thoughts

The workshop reinforced that bioeconomy is a transformative force that can drive sustainable development and economic growth when approached holistically. Participants emphasized the need for continued engagement, collaboration, and knowledge-sharing to ensure the regionalization of bioeconomy strategies aligns local opportunities with global targets.

PRESENTATION OF EXHIBITORS

BioInnovate Africa

BioInnovate Africa is a regional science and innovation-driven initiative that is supported by the Swedish International Development Cooperation Agency (Sida) and implemented by the International Centre of Insect Physiology and Ecology (icipe) in Nairobi, Kenya.

The initiative supports scientists in Eastern Africa to link biological based research ideas, inventions, and technologies to business and the market. Scientists work collaboratively in a regional context, and involve interdisciplinary teams from academia, industry and government to co-develop solutions that address the region's development priorities. Collaboration at the national and regional level, and creating links between research and industry, are some of the surest ways of translating scientific outputs into usable goods and services in daily life.

While funding biological based innovation projects remains the core activity of BioInnovate Africa, the initiative also supports development of policies and strategies that foster a sustainable bioeconomy in Africa.

https://bioinnovate-africa.org/

BioInnovation Institute

BioInnovation Institute Foundation IBII) is an international commercial foundation with a non-profit objective that accelerates world-class life science start-up innovation to benefit people and society. BII is base in Copenhagen, Denmark and is supported by Novo Nordisk Foundation.

Through its three-venture building and acceleration programs – Bio Studio, Venture Lab, and Venture House, BII supports life science start-ups with knowledge, network, infrastructure, business development, mentoring, and funding of up to three million euros per project and 1,8 million euros per start-up. Since its inauguration in 2018, BII has awarded over 99 million euros to over 100 high-growth start-ups, that have in turn raised more than 500 million euros from other sources as of March 2024.

https://bii.dk/

Cabinet Office, Government of Japan

The Cabinet Office is a ministry of the Japanese government. It assists the Cabinet with its policy planning and comprehensive policy coordination on important issues (economic and fiscal policy, science and technology policy, intellectual property strategy, and disaster management).

https://www.cao.go.jp/index-e.html

Circular Bio-based Europe Joint Undertaking

The Circular Bio-based Europe Joint Undertaking (CBE JU) is a 1 – 2 billion partnership between the European Union and the Bio-based Industries Consortium that funds projects deploying competitive, sustainable and circular bio-based industries in Europe. CBE JU aims to boost Europe's competitiveness in the bio-economy sector, create new green jobs and offer alternative income sources to primary producers in regions, and address today's environmental challenges.

Since 2014, CBE JU has supported over 190 projects focusing on developing innovative technologies and bio-based solutions for crop protection and fertilisation, plastics, textile, food, chemicals, packaging, construction and other sectors.

https://www.cbe.europa.eu/

DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH

The objective of the DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH is application-oriented research and development in the field of energetic and integrated material use of renewable raw materials in the bioeconomy. With partners from research and industry in the Global North and South we explore innovative techniques and their economic, social and environmental impacts.

https://www.dbfz.de/

Embassy of Sweden

Wood is one of the few renewable building materials and the Embassy, together with several partners, has been working on commercial forestry and sustainable construction. At GBS, the Embassy presents the Woodlife Sweden exhibition which showcases projects that visualise how architecture, design and urbanism can help reduce the climate impact of buildings and products, and impact future development in line with the 17 Sustainable Development Goals (SDGs).

Project core partners: Swedish Institute, The GoDown Arts Centre and Gatsby Africa

https://www.swedenabroad.se/en/embassies/kenya-nairobi/

Forschungszentrum Juelich GmbH

The Bioeconomy Cluster at Forschungszentrum Juelich aims to establish a thriving regional bioeconomy that leverages the strengths of the Bioeconomy Science Center (BioSC), the transformation hub BioökonomieREVIER to shape the innovation-driven transition in the Rhenish region and the EU project BIO2REG to support EU regions in the bioeconomy transition. The cluster integrates research, industry, education, and community engagement to foster circular bio-based solutions, promote regional economic resilience, and address global sustainability challenges. BioSC serves as a regional research and education hub, clustering activities from Forschungszentrum Juelich and three regional universities. BioSC's systemic approach to bioeconomy fosters interdisciplinary research and education, enabling the development of innovative solutions that support the regional transition.

https://www.fz-juelich.de/de

IACGB Bioeconomy Youth Champions

The International Advisory Council on Global Bioeconomy selected geographically diverse and aspiring young professionals to be Bioeconomy Youth Champions. Our aim is to foster the creation of a global and inclusive Bioeconomy Youth and Young Professionals Community that seeks to create connections, collaborate, and give a platform to the needs of the broader community.

https://www.iacgb.net/youth

icipe

Headquartered in Nairobi, Kenya, icipe was established in 1970, to address this very paradox of insects and accompanying challenges. The Centre's mission is to use insect science for sustainable development, to ensure food security and improve the overall health of communities in Africa by addressing the interlinked problems of poverty, poor health, low agricultural productivity and environmental degradation.

Since its founding, icipe has remained committed to developing and disseminating environmentally safe, affordable, acceptable and accessible tools and strategies to control insect pests and disease vectors. icipe's mandate further extends to the sustainable conservation and utilisation of Africa's rich biodiversity.

https://www.icipe.org/

The Alliance of Bioversity and CIAT

The Alliance of Bioversity International and CIAT delivers research-based solutions that harness agricultural biodiversity and sustainably transform food systems to improve people's lives. To do so, the Alliance works with local, national and multinational partners across Latin America and the Caribbean, Asia and Africa, and with the public and private sectors. With partners, the Alliance generates evidence and mainstreams innovations in large-scale programs to create food systems and landscapes that sustain the planet, drive prosperity and nourish people in a climate crisis.

https://alliancebioversityciat.org/

The Swedish International Agricultural Network Initiative, SIANI

The Swedish International Agricultural Network Initiative – SIANI – is a global, open and inclusive network that supports and promotes multi-sector dialogue and action around our vision of sustainable, rights-based and inclusive food systems. SIANI is hosted at the Stockholm Environment Institute HQ in Stockholm, Sweden.

https://www.siani.se/

PROGRAMME

GLOBAL BIOECONOMY SUMMIT 2024

DAY 1 – WEDNESDAY 23 OCTOBER 2024

07.30 – 08.20	**Registration**
08.20 – 09.05	**Official Opening and Welcome Addresses**

Welcome and Introduction by Moderator
Session Chairs: **Prof Christine Lang, Dr Elspeth MacRae,** and **Dr Julius Ecuru**, Co-Chairs, IACGB
Speakers:

- **Prof Christine Lang**, Co-Chair, International Advisory Council on Global Bioeconomy (IACGB), Germany
- **Dr Abdou Tenkouano**, Director General, International Centre of Insect Physiology and Ecology (*icipe*), Kenya
- **Bettina Stark-Watzinger**, Minister, German Federal Ministry of Education and Research (video message), Germany
- **Claudia Mueller**, Parliamentary State Secretary, German Federal Ministry of Food and Agriculture, Germany
- **Ambassador Caroline Vicini**, Swedish Ambassador to Kenya, Sweden
- **Dr Andrew Mwihia Karanja**, Cabinet Secretary, Ministry of Agriculture and Livestock Development, Government of Kenya

09.05 – 11.00 **Plenary Session I: Keynotes and Panel –** *Bioeconomy's Role and Impact in Today's Political, Economic, and Ecological Landscape*

• Sustainable Circular Bioeconomy • Biologization of industry • Foresight studies and global innovation agenda

Session Chairs: **Prof Christine Lang** and **Dr Julius Ecuru**, Co-Chairs, IACGB

Speakers:

- **Dr Ertharin Cousin,** President and CEO, Food Systems for the Future, USA
- **Prof Mans Nilsson**, Executive Director, Stockholm Environment Institute, Sweden
- **Carina Pimenta**, National Secretary for the Bioeconomy in the Government of Brazil

Panel Session: Bioeconomy's Role Today

- **Prof Joachim von Braun,** Distinguished Professor (em.) for Economic and Technological Change at the Center for Development Research (ZEF), Bonn University, President, Pontifical Academy of Sciences, IACGB, Germany
- **Fortunate Muyambi**, Deputy Executive Secretary, East African Science & Technology Commission, East African Community, Uganda
- **Dr Elspeth MacRae**, Co-Chair International Advisory Council on Global Bioeconomy, New Zealand
- **Pekka Pesonen**, Permanent Secretary, Ministry of Agriculture and Forestry, Government of Finland
- **Ana Del Hierro Calvachi,** IACGB Youth Champion, Ecuador

11.00 – 11.30 **Coffee Break**

11.30 – 13.00 **Breakout Session I: 8** *Parallel Workshops Around Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy*

Workshop	Organiser	Meeting Room
An Intergenerational Dialogue: How to Bridge Youth Visions for Bioeconomy with International Policies on Bioeconomy?	**FAO/ IACGB Youth Champions**	**Bogoria**
Bioeconomy Meets ONE HEALTH - How to Develop Regional Value Creation Ecosystems Based on Medicinal Plants and Herbs Cultivation	**University of Greifswald**	**Room 1 – Butterfly**
Exploring Global Collaboration Opportunities for Universities in the Bioeconomy Field	**European Bioeconomy University Alliance (EBU)**	**Room 8 – Cricket**
Factors Impacting the Implementation of Biorefinery Technologies in the Global Economy	**Department of Science and Innovation, South Africa**	**Room 4 – Beetle**
The Power of Many: Addressing Global Food System Challenges Through Innovation in a BioEconomy Context	**Seeding The Future van Lengerich Foundation**	**Bouganville**
Harnessing Collective Intelligence for Bioventures Solutions in LATAM	**Inter-American Institute for Cooperation on Agriculture (IICA)**	**Room 7 – Mosquito**
Financing the Bioeconomy: African Opportunities and Challenges	**World Bioeconomy Forum/ NatureFinance/ Ecosystems Finance Health**	**Room 6 – Grasshopper**
Making it real – Exploring Concrete Actions and Recommendations Towards Fostering the Implementation of the African Union (AU) - European Union (EU) Innovation Agenda through Bio-Economy Collaboration	**BioInnovation Institute Foundation (BII)**	**Ivory**

13.00 – 14.00 **Lunch**

14.00 – 16.00 **Plenary Session II: Keynotes and Panel –** *The Innovation Ecosystem for Bioeconomy - Finance, Technologies and Societal Initiatives*

- *Challenges and steps towards a bioeconomy future*
- *Business, finance and policy makers contribute to a positive bioeconomy innovation ecosystem*
- *Global R&D and business value-chains*
- *Regional networks and local initiatives*
- *Social innovation*
- *Traditional knowledge and frugal innovation*

Session Chairs: **Dr Mary Maxon** and **Prof Ian O'Hara**, IACGB

Speakers:

- **Morten Enggaard Rasmussen**, Executive Vice President, People and Stakeholder Relations, Novonesis, Denmark
- **Dr Kelly Seagraves,** Senior Advisor, Biotechnology Policy, US Department of State, Office of the Special Envoy for Critical and Emerging Technology, USA
- **Dr Linda Davis**, Founder and CEO, Giraffe Bioenergy, Kenya
- **Franck Leroy**, President of Grand Est, France (video message)

Panel: Innovation in Bioeconomy Technologies and Finance

- **Nicoló Giacomuzzi-Moore**, Executive Director, Circular Biobased Europe, Belgium
- **Dr Stefania Abakerli**, Senior Climate Specialist, World Bank, USA
- **Zhengzheng Qu,** Programme Manager, Nature and Climate Finance, UN Environment Programme, China/Kenya
- **Mandla Nkomo**, Chief Executive Officer, Partners in Food Solutions, Zimbabwe
- **Dr Lily Eurwilaichitr**, Assistant Executive Director, National Energy Technology Centre, National Science and Technology Development Agency, Thailand
- **Hailey Ciantar**, European Commission Bioeconomy Youth Ambassador, Malta

16.00 – 16.30 **Coffee Break**

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16.30 – 18.00	**Breakout Session II: 8** *Parallel Workshops Around Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy*

Workshop	Organiser	Meeting Room
AI-Powered Solutions for Pest and Disease Management in Primary Bioeconomy Production	**International Bioeconomy Forum/ ICT-AGRI ERA-NET**	**Arcade 8: Cricket**
The Significance of Water in Bioeconomy Strategies	**Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB**	**Bogoria**
Sustainable Bioenergy-Biochar Systems and Circular Bioeconomy	**CIFOR-ICRAF**	**Room 4 - Beetle**
Availability of and Competition for Biomass in the Bioeconomy	***icipe*/ University of Bonn**	**Bouganville**
Healthy Soils: An essential Prerequisite for Sustainable Bioeconomy	**Eco-Environment Innovation/ Art and Nature Foundation Nantesbuch**	**Room 6 - Grasshopper**
Let's Create a Future-Ready bioeconomy: Innovative, Inclusive and Sustainable!	**EU Bioeconomy Youth Ambassadors**	**Room 7 - Mosquito**
Private-Public Cooperation in the Bioeconomy as a Driver for (re)-Industrialisation	**Bio-based Industries Consortium (BIC)**	**Room 1 - Butterfly**
The Contribution of Forest Products to the Sustainable Bioeconomy in Africa - Trends, Challenges and Opportunities	**FAO**	**Ivory**

18:45 - 20:45	**NETWORKING DINNER** **GBS2024 Co-Hosts will Present the 2024 State of the Bioeconomy in East Africa Report**

CLOSE OF DAY 1

GLOBAL BIOECONOMY SUMMIT 2024

DAY 2 – THURSDAY 24 OCTOBER 2024

07.30 – 08.30	**Registration**
08.30 – 09.00	**Opening Addresses: Welcome and Introduction to Day 2**

Speakers:

- **Dr Eliane Ubalijoro**, CEO, The Center for International Forestry Research and World Agroforestry (CFOR-ICRAF), Kenya
- **Margrethe Vestager,** Executive Vice-President, Biotech and Biomanufacturing (European Commission), (video message), Denmark
- **Michael Kellner**, Deputy Minister, German Federal Ministry of Economic Affairs and Climate Action (video message), Germany

09.00 – 11.00	**Plenary Session III** *Bioeconomy, a Pathway for Strengthening Agri-food Systems Resilience and Climate Action in Africa and the Global South* Session Chairs: **Prof Lucia Pittaluga** and **Ben Durham**, IACGB

Speakers:

- **Dr Getaw Tadesse,** Director, Department of Operational Analysis, AKADEMIYA 2063, Rwanda
- **Dr Julio Berdegué Sacristán**, Minister of Agriculture and Rural Development, Government of Mexico (video message) Panel 1: Bioeconomy Policy Priorities for Equitable Global Development
- **Dr Peter Minang**, Africa Director, Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), Kenya
- **Dr Jean Jacques Muhinda**, Regional Director, East and Southern Africa, Alliance for a Green Revolution in Africa (AGRA), Kenya
- **Dr Peggy Oti Boateng**, Executive Director, African Academy of Sciences, Ghana

Panel 2: Innovation and Entrepreneurship in Bioeconomy

- **Daniel Ndima**, Chief Executive Officer, Cape Bio, South Africa
- **Talash Huijbers**, Founder and CEO, InsectiPro Ltd, Kenya
- **Ginette Karirekinyana**, Founder and CEO, Karire Products Ltd, Burundi
- **Prof Karoli Nicholas Njau**, Founder and CEO EnvSol Ltd, Tanzania

Panel 3: Bioeconomy Pathways: Perspectives on Evolving Visions and Emerging Strategies in Africa, Latin America, and Asia

- **Dr Francis X. Johnson**, Senior Research Fellow and Climate Lead, Stockholm Environment Institute – Asia Centre, Thailand/Sweden
- **Monica Trujillo,** Senior Researcher, Stockholm Environment Institute, Colombia
- **Fortunate Muyambi**, Deputy Executive Secretary, East African Science and Technology Commission, Rwanda
- **Dr Warinthorn Songkasiri**, Director of Biochemical Engineering and Systems Biology Research Group, National Center for Genetic Engineering and Biotechnology, Thailand
- **Dr Aisha M. Nakitto,** Scientist, Dept of Policy Innovations, AKADEMIYA2063, Rwanda

11.00 – 11.30 — **Coffee Break**

11.30 – 13.00 — **Breakout Session III: 8** *Parallel Workshops Around Three Thematic Tracks: Advancing Knowledge and Innovation, Driving Industry and Markets, and Shaping the Global Bioeconomy*

Workshop	Organiser	Meeting Room
Connecting Young Changemakers and Thought Leaders to Shape a Sustainable Future	**IACGB Bioeconomy Youth Champions**	**Room 1 - Butterfly**
Leveraging the Nexus of Biodiversity Informatics and Bioeconomy to Improve Rural and Urban Livelihoods	***icipe***	**Bogoria**
Metrics and Technical Standards to Monitor the Economic Contribution and Sustainability of the Bioeconomy and Foster Innovation	**UN-ECLAC**	**Room 7 - Mosquito**
Feedstocks for New Value Chains, Unlocking Full Potential of Crop Residues and Food Processing Side-Streams	**LL-BioEconomy, Research and Advisory**	**Room 6 - Grasshopper**
Will Small-Scale African farmers be Active Participants in the Worldwide Circular Bio-Economy by 2044?	**DIVAGRI Project (funded by EU)**	**Room 8 - Cricket**
Building Sustainable and Inclusive Forest-Based Bioeconomy Value Chains and Business Models Globally	**International Bioeconomy Forum (IBF) Working Group on Forestry**	**Room 4 - Beetle**
Ready for Takeoff: Empowering Africa's Workforce for the Bioeconomy and a Just Transition	**The Roundtable on Sustainable Biomaterials (RSB)**	**Ivory**
Regionalisation of Bioeconomy: Nested Approaches from Global Targets to Local Implementation	**Forschungszentrum Juelich**	**Mt Kenya D**

13.00 – 14.00 — **Lunch**

14.00 – 16.00 — **Plenary Session IV:** *Way Forward: Science, Partnership, Shared Responsibilities and Joint Platforms; Bioeconomy in the Global Agenda*

• Steps towards transformation • Global Bioeconomy Investment • Global Bioeconomy Partnership • Bioeconomy in economy strategies

Session Chairs: **Dr Órlaith Ni Choncubhair** and **Hugo Chavarria**, IACGB

Speakers:

- **Prof Xian-En Zhang,** Chair Professor, Dean and Chair Professor, Faculty of Synthetic Biology, Shenzhen University of Advance Technology, China
- **Dr Maximo Torero,** Chief Economist, FAO (video message), Peru/EU
- **Vikash Abraham,** Chief Strategy Officer, Naandi, India
- **Ambassador André Corrêa do Lago,** Secretary for Climate, Energy and Environment, Ministry of External Affairs of Brazil (video message)

Panel 1: Bioeconomy Transformation

- **Prof Stéphanie Baumberger,** Institut Jean-Pierre Bourgin, AgroParisTech, Université Paris-Saclay, France
- **Dr Rose Mwebaza**, Representative and Reginal Director for Africa, United Nations Environment Programme (UNEP), Uganda
- **Dr Anamika Dey,** Chief Executive Officer, GIAN, India
- **Lara Kotzé-Jacobs,** CSIR Program Manager, Biomanufacturing Industry Development Centre, South Africa
- **Francis Sullivan**, Chair of the Sustainable Biomass Program, UK/Canada

Panel 2: Bioeconomy Partnerships

- Statements from partners on intent to establish a Global Bioeconomy Partnership

16.00 – 16.30 — **Coffee Break**

16.30 – 17.30 — **Plenary Session V:** *Top level Summaries, Communiqué and Debate*

• Impact and implementation – Goals by 2030 and 2045/2050 • Presentation of the 2024 Communiqué recommendations

Session Chairs: **Prof Christine Lang, Dr Elspeth MacRae,** and **Dr Julius Ecuru**, Co-Chairs, IACGB

- Report back on workshops to the Summit
- Presentation of the GBS2024 Communique: **Prof Christine Lang, Dr Elspeth MacRae,** and **Dr Julius Ecuru**, Co-Chairs, IACGB
- Presentation of the Global Bioeconomy Summit Youth Communique: **Bertha Shifeta** and **Ana Del Hierro Calvachi**

17.30 – 17.50 — **Farewell and Closing of the Global Bioeconomy Summit 2024**

- Program close by Global Bioeconomy Summit Co-Chairs: **Prof Christine Lang, Dr Elspeth MacRae,** & **Dr Julius Ecuru**, Co-Chairs, IACGB
- Concluding remarks by host: **Dr Abdou Tenkouano**, Director General, *icipe*, Kenya

END OF GBS2024