Inclusive Growth through Sustainable Bioinnovations

A Report of the BioInnovate Africa Programme Phase II Inception Meeting, and Regional Bioeconomy Symposium held on 2 – 3 November, 2017, Kigali, Rwanda

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Inclusive Growth through Sustainable Bioinnovations: A Report of the BioInnovate Africa Programme Phase II Inception Meeting, and Regional Bioeconomy Symposium held on 2 – 3 November, 2017, Kigali, Rwanda.

Prepared by

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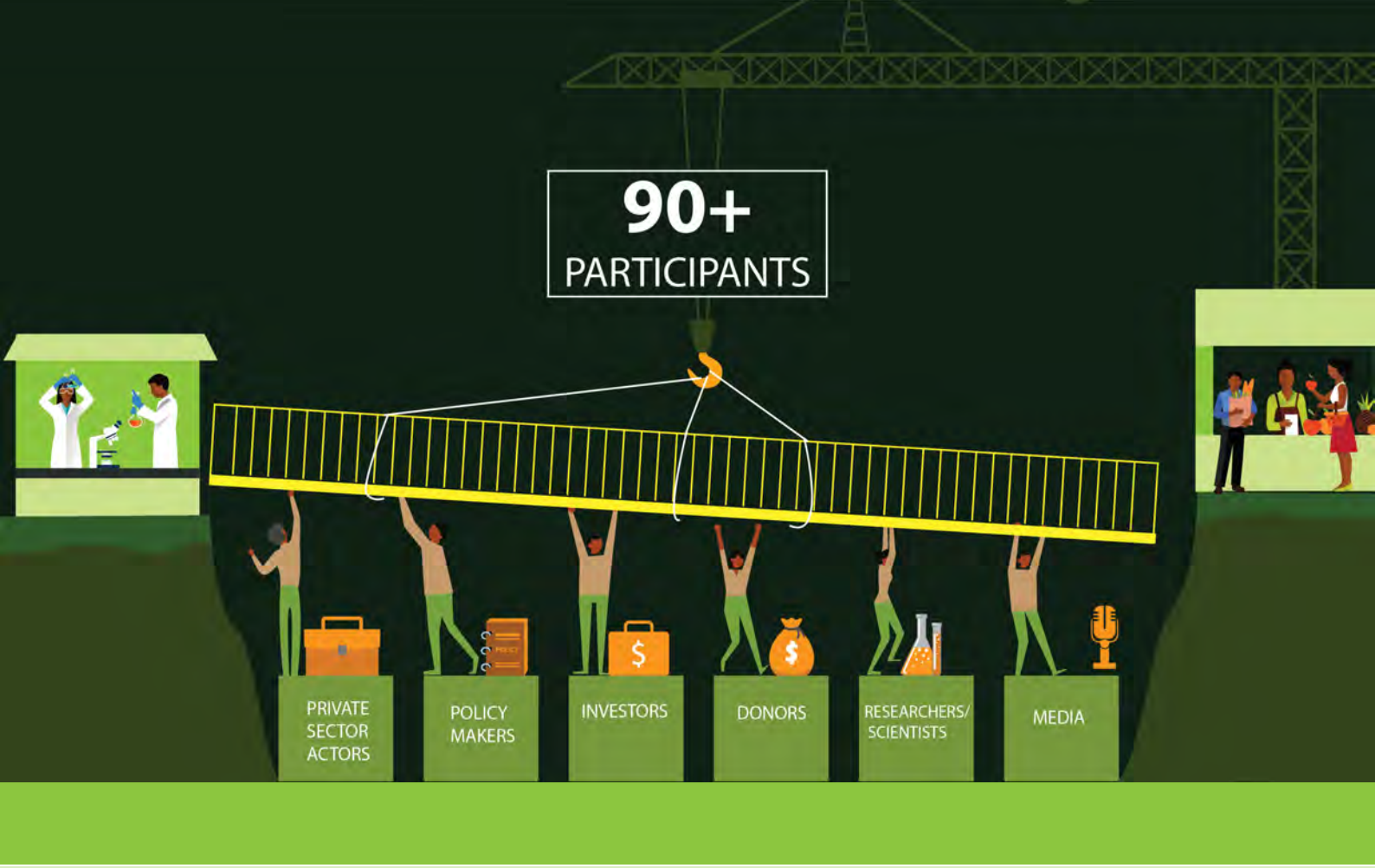
1. Achieving inclusive growth through sustainable bioinnovations

BioInnovate Africa facilitates collaboration between scientists, policymakers, and industry partners towards the development and translation of innovative bioscience research ideas and technologies into products for the market or end users. Some of the previous collaborations have been around crop improvement technologies, wastewater treatment systems, and agri-food processing. BioInnovate Africa will continue these efforts in phase II (2016 – 2021) with emphasis on linking bioscience research ideas and technologies directly to business and the market.

The BioInnovate Africa Programme is a regional initiative supported by the Swedish International Development Cooperation Agency (Sida). It is implemented by *icipe*, based in Nairobi, Kenya, and operates in six eastern Africa countries namely: Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda.



An inception meeting for BioInnovate Africa Phase II, and a regional bioeconomy symposium, was co-organised with the National Council for Science and Technology of Rwanda (NCST) on 2 and 3 November, 2017, in Kigali, Rwanda. Over 90 stakeholders, including policymakers, private sector actors, investors, researchers, scientists, donors, and the media were in attendance (see complete list of participants in Annex 1). Key among the participants were Rwanda's Minister of Education, and Uganda's Minister of Science, Technology and Innovation.

BioInnovate Africa fosters a bioeconomy, which is a range of economic activities involving the use of renewable biological resources – such as crops, forests, animals, and micro-organisms (like bacteria) – to solve challenges related to food, health, environmental protection, energy, and industrial processes. Like many parts of the continent, eastern Africa possesses large quantities of renewable biological resources. A bioeconomy would be highly impactful in the transformation of these biological resources into goods and services with a higher commercial value, and that are more environmentally and socially sustainable. This will not only diversify the economy, but also encourage inclusive growth by creating income generating opportunities for women and youth.

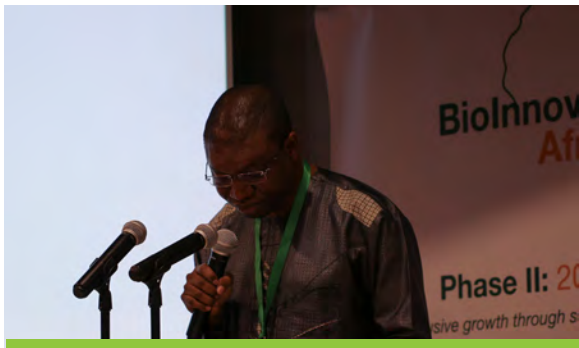
3. Symposium outcomes

4. Statements and reflections

Dr. Julius Ecuru
Programme Manager - BioInnovate Africa

This symposium is a critical step in initiating regional dialogues towards building an innovation-driven eastern Africa bioeconomy. Transforming agroprocessing so that it effectively adds value to agricultural and other bioresources, and converting biowastes into useful goods and services, can promote competitiveness of firms, and enhance productivity of smallholder farmers and communities. An innovation-driven bioeconomy, which BioInnovate Africa is fostering in eastern Africa, will lead to improved resource efficiencies, and contribute towards the UN Sustainable Development Goals, especially goal 2 (achieving food security) and goal 9 (sustainable industrialization and fostering innovation).

icipe's four-theme approach and focus on the development and dissemination of science-led, environmentally friendly, accessible, and affordable solutions make it an ideal fit for BioInnovate Africa. *icipe* also provides an enabling eco-system that supports interdisciplinary engagements with researchers, policymakers and private sector, all with the goal of promoting inclusive growth and sustainable development in Africa. Dr Ekesi also announced the BioInnovate Africa second call for concept notes for sustainable bioinnovations.



Dr. Sunday Ekesi
on behalf of Dr Segenet Kelemu
Director General, *icipe*

Prof. Manasse Mbonye
Executive Secretary - NCST, Rwanda

Curiosity remains scientists' main motivation. Many countries, including Rwanda, now officially base their national development strategies on science and technology, and as such new incentives to promote scientific research are emerging. A bioeconomy is a desirable incentive, as it effectively connects scientific curiosity and the continent's economic growth priorities. Going forward, investments in innovative solutions for mitigating climate change and instensifying agricultural production, should be the main drivers of collaboration between academia and industry.

NEPAD Agency's strategies under STISA 2024 and AU Agenda 2063 focus on current and emerging inter-discplinary technologies that have a strong bearing on efforts to foster an innovation-driven bioeconomy in Africa. These include application of gene drives for control and elimination of disease vectors, drone technology for transforming Africa's agriculture, and promoting micro-grids for expanding Africa's access to energy. These technological convergences are rapidly advancing, and will soon present new opportunities for BioInnovate Africa to link them with market actors.

Prof. Diran Makinde
Senior Advisor - NEPAD Industrialization, Science, Technology and Innovation Hub

Dr. Claes Kjellstrom
Senior Policy Specialist - Department for Africa, Sida

Sida promotes research synergies in new and emerging areas including biotechnology, making BioInnovate Africa one of its flagship programmes in this regard. Besides BioInnovate Africa, other examples of regional initiatives being supported by Sida are the Biosciences eastern and central Africa – International Livestock Research Institute (BecA-ILRI) hub and the Western Indian Ocean Marine Science Association (WIOMSA). Because of the potential transformative nature of bioscience innovations for the people of eastern Africa, Sida increased its funding for BioInnovate Africa Programme Phase II to SEK 120.7 million (approximately USD 14.2 million) up from SEK 100.7 (around USD 11.8). Sida is also very interested to see, and would support increased participation of female scientists in the BioInnovate Africa programme.

BioInnovate Africa promotes regional integration and cooperation in eastern Africa. The region has a shared challenge to transform its rich biological resources in ways that enable it to achieve food security, reduce carbon dioxide emissions, and conserve biodiversity. BioInnovate Africa should continue to provide more opportunities for increased cross border, multidisciplinary collaborative research and innovation involving biological and related resources. This is in tandem with Rwanda's development strategy that emphasises use of science and technology to create a modern, knowledge-based economy. Rwanda's efforts so far include policies and regulatory incentives to promote biodregradable packaging material, use of clean seeds, and research in higher yield crop varieties. Further, investments are also being made to build capacity through science, technology, engineering and mathematics (STEM) education, and technical and vocational training and education (TVET). Rwanda hosts the East African Science and Technology Commission (EASTCO), and commits to revitalize science and technology for social economic development in eastern Africa. In this regard, Rwandese scientific community should increase their participation in the BioInnovate Africa Programme.

Hon. Dr. Papias Malimba
Musafiri Minister of Education - Rwanda

AU Agenda 2063 is the African Union strategic framework for socio-economic transformation of the African continent over a 50-year period.

The ideals of the SDGs are not new; the difference now is that their implementation calls for innovative planning, execution, evaluation and impact assessment to attain sustainable and inclusive development, exemplified by economic growth, environmental protection, and social inclusion. There is a tendency in current global implementation processes of the SDGs for trade-offs in favour of economic development, at the cost of social and ecological goals. However, everything possible should be done to minimize or remove these tradeoffs, and instead develop different pathways and synergies to achieve sustainable development. A bioeconomy should aspire to attain SDGs in a socially inclusive manner, and have an especially deep commitment to social justice. This will ensure that the poor and marginalized will participate in anticipated development efforts, including setting priorities, policy formulation, and governance, and ensure accountability and rewards from these actions.

Dr. Belay Begashaw
Director General - Sustainable Development Goals Centre for Africa
Kigali, Rwanda

Hon. Prof. Ruth K. Oniang'o
2017 Africa Food Prize Laureate, and member of the Bioinnovate Africa Programme Advisory Committee

Africa's growing demand for adequate, safe, and nutritious food should serve as a reminder that the continent is not only capable of feeding itself, but the entire world. Achieving a food secure Africa presents new and exciting opportunities for scientists and innovators to think and act creatively, and to solve real food problems with their innovations. Individual motivation, and the desire to serve for the greater good, are paramount for success, and these ideals should be evident within BioInnovate Africa.

The Ugandan government has taken decisive steps to promote an innovation-driven bioeconomy, including establishing a department for bioeconomy within the Ministry of Science, Technology and Innovation, enacting a biosafety law for bioengineered products, and setting up a national innovation fund. At national and regional levels, a number of key policy actions are required to drive a regional bioeconomy agenda. These include:

- Restructuring financial resources, and attracting skilled and competent professionals to support bioeconomy development.
- Ensuring good science, technology and innovation institutional frameworks, with emphasis on nurturing strong university, industry, and government relationships.
- Developing a regional bioeconomy strategy with shared goals and objectives, and fully integrated within eastern Africa's key economic sectors.
- Promoting integration by utilizing opportunities provided by different trade zones such as the East African Customs Union, and the Common Market for Eastern and Southern Africa (COMESA), to develop a vibrant regional bioeconomy.
- Adding value to genetic resources.
- Inculcating a culture of bio-entrepreneurship, and supporting business incubation.

Hon. Dr. Elioda Tumwesigye
Minister of Science, Technology, and Innovation - Uganda

5. Other speakers

Dr. Jacob Mignouna
Director - BecA-ILRI Hub, Kenya

Opportunities for acquiring advanced skills in understanding plant and animal genetics, diagnosing diseases or profiling foods for safety and nutritional enhancement are increasingly becoming available in the region through regional centres such as the BecA-ILRI Hub. These upstream technology platforms provide the pipeline for innovation within the bioeconomy.

The modern biosciences can support sustainable development. Sustainable bioeconomies, where nonrenewable raw materials are being gradually replaced with renewable biobased resources, is policy priority for most European countries. This presents Europe and Africa with an opportunity to develop mutually beneficial partnerships to strengthen each other's bioeconomy potentials.

Dr. Ivar Virgin
Senior Researcher - Stockholm Environmental Institute, Sweden

Prof. Lene Lange
Technical University of Denmark, Denmark

East Africa can unlock the full potential of its enormous bio-resources for a smarter, more sustainable and inclusive society. Understanding the main drivers for this, which include, increased demand for biobased products, improved resource efficient and optimal use of biomass, will be an essential aspect of defining the bioeconomy agenda for the region.

Business development forms an integral part of an innovation driven bioeconomy, and entrepreneurial opportunities are emerging for biobased businesses in the region. Growth Africa, which is located in Kenya, is accelerating growth of a number of business enterprises, including some in the biobased industry.

Dr. Ian Lorenzen
Co-Founder - Growth Africa Ltd., Kenya

Prof. Beth Kaplin
University of Rwanda, Rwanda

Conservation biology offers new opportunities for bio-business development. New tools such as DNA finger printing and barcoding can help in monitoring illegal trade in endangered animal species and designing better conservation programs. The ongoing work in Rwanda demonstrates the added societal value of investing in the bioeconomy.

Regional harmonization of trade and investment policies can be a great incentive for the bioeconomy. The East African Trade and Investment Hub provides opportunities for cross border linkages and offers technical assistance with respect to access to markets in the region and abroad.

Mr. Zephanie Niyonkuru
Country Representative - East Africa Trade and Investment Hub, Rwanda

The Banana Investment Limited located in Arusha, Tanzania, is an example of a bioeconomy in practice. With support from BioInnovate Africa, the factory has developed integrated systems for cleaning waste water to acceptable national standards for discharge, and produces biogas and bio-fertilizers from the digestion process.

Mr. Adolf Olomi
General Manager - Banana Investments Ltd., Tanzania

6. Conclusions

Rapid urbanization, changing lifestyles, and a rising middle class are among the key drivers of a sustainable bioeconomy. As people become more health conscious, their preference for healthier, more nutritious, and easy to cook foods increases, as will use of natural personal care products. These trends present opportunities for innovators to develop value added foods and products with less toxic chemical preservatives.

In creating a regional bioeconomy strategy, there must be significant buy-in from stakeholders, particularly policy makers, who can influence investments in science, technology, and innovation by governments. A regional strategy also encourages healthy debate on what a successful bioeconomy should be, and clearly defines stakeholders' roles in achieving it. BioInnovate Africa plays a significant role of facilitating participation of all stakeholders in critical deliberations and actions.

Free movement of goods, services, and human resources within East Africa is an opportunity to support development of a regional bioeconomy.

Additional effort is needed to address capacity gaps, especially in scientific and technical skills, infrastructure, and funding. BioInnovate Africa's contribution to this would be consultation with stakeholders, needs identification, and design and implementation of necessary interventions.

Bioentrepreneurship and business incubation should be promoted, especially among young scientists and innovators, by establishing incubation centres in and around universities and research institutes.

7. Recommendations

Continued engagement with policy actors and other stakeholders in the BioInnovate Africa partner countries to identify and provide incentives for developing a regional, innovation-driven bioeconomy.

Ensure a strong techno-economic assessment and market analysis for technologies supported by BioInnovate Africa, including financial projections and investment needs. Findings can then be presented to potential investors, governments, and donor representatives.

Develop and execute activities that enable scientists to understand the scientific and technological challenges private sector companies face, and collaborate to provide solutions. These activities could be targeted meetings or conferences aimed at building relationships and partnerships with the private sector.

Encourage participation of women scientists and innovators, as well as the youth, in developing an innovation-driven bioeconomy in the region.

8. BioInnovate Africa project summaries

8.1 The Pitch

Following the first round of BioInnovate Africa's call for proposals in April 2017, eleven successful teams had the opportunity to pitch their projects at the symposium. The teams comprised 51 scientists and innovators from research institutes, universities, and private firms in the BioInnovate Africa partner countries.

The pitching session was moderated by a three-judge panel. It aimed at obtaining buy-in from potential investors, and identifying opportunities for collaboration. Each team leader had five minutes to present their project, and field questions from the judges and the audience.

The pitches sought to demonstrate projects' potential and effectiveness to deliver innovative solutions for food and nutritional security, crop production, value addition to commodities, and enhanced green industrial processes. The projects also showed their relevance across research and commercial sectors, and geographical borders.

Further discussions revealed challenges in effectively transforming technologies into commercially viable enterprises. These include the need for capacities to understand, design and implement innovation projects, and a better innovation eco-system with enhanced coordination among relevant stakeholders.

8.2 The Projects

Partnership to deliver Striga weed resistant maize and finger millet varieties to the market

Aim: To commercialize Striga weed tolerant maize and finger millet

Leader: Matthews Dida - Maseno University, Kenya

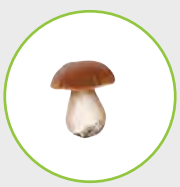
Partners:
Agri Seed Company Limited, Kenya
Busitema University, Uganda
National Semi Arid Resorces Research Institute, Uganda

Commercialization of novel sorghum and millet products for improved socio-economic gains in eastern Africa

Aim: To commercialize nutritious sorghum and millet products that address the needs and challenges of the modern lifestyle

Leader: Yusuf Byaruhanga - Makerere University, Uganda

Partners:
Sokoine University of Agriculture, Tanzania
Hawassa University, Ethiopia



Commercialization of nutrient-rich mushroom substrate blocks in East Africa

Aim: To commercialize mushroom substrate block which is nutrient–rich, affordable, portable, and reliable, making mushroom production less laborious and less time and space consuming

Leader: Bertha Mamiro - Tanzania Industrial Research and Development Organisation, Tanzania

Partners:
OKOA Society, Tanzania
Global Agro Concept Ltd., Rwanda

A regional enterprise to commercialize an integrated technology for waste water treatment and biowaste conversion in eastern Africa

Aim: To establish a bio-based integrated waste water treatment technology enterprise that can attract both local and foreign investment

Leader: Karoli Njau - The Nelson Mandela African Institution of Science and Technology, Tanzania

Partners:
Addis Ababa University, Ethiopia
Makerere University Uganda
iTEC, Tanzania

Insect-based agribusiness for sustainable grasshopper and cricket production and processing for food

Aim: To rear and process grasshoppers and crickets into ready-to-eat whole insects and ingredient flours

Leader: Dorothy Nakimbugwe - Makerere University, Uganda

Partners:
International Centre of Insect Physiology and Ecology (*icipe*), Kenya
Agrarian Systems Limited, Uganda
Treasure Industries Limited, Kenya

Promotion of post-harvest disinfestation treatment for mango, avocado, French beans, and bell pepper

Aim: To establish post-harvest disinfestation treatment plants coupled with sound area-wide pre-harvest eco-friendly treatment against the quarantine pests of mango, avocado, French bean and bell pepper jointly with private agri-entrepreneurs

Leader: Samira A. Mohamed - International Centre of Insect Physiology and Ecology (*icipe*), Kenya

Partners:
Kibwezi Agro Limited, Kenya
National Agricultural Research Organization (NARO), Uganda
Sulma Foods Limited, Uganda

Adaptation of refractance window drying technology for production of high quality fruit and vegetable bioproducts

Aim: To utilize refractance window drying technology in fruit and vegetable processing for local consumption and export

Leader: John Muyonga - Makerere University, Uganda

Partners:
Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya
Kenya Industrial Research and Development Institute (KIRDI), Kenya
TONNET Agro-engineering company Limited, Uganda
East Africa Nutraceuticals Ltd., Kenya
Food and Nutrition Solutions Ltd (FONUS), Uganda
Ministry of Trade, Industry and Cooperatives, Uganda

Nitrogen bio-fortified and pelletized commercial-grade organic fertilizer from urban biowaste

Aim: To produce high quality and affordable nitrogen bio-fortified and pelletized commercial grade organic fertilizer from municipal biowaste, which will be preferred by smallholder farmers for soil fertility enhancement

Leader: Anthony Mshandete - University of Dar es Salaam, Tanzania

Partners:
Makerere University, Uganda
Tursam Investment Limited, Uganda
Sokoine University of Agriculture, Tanzania
Tanzania Commission for Science and Technology (COSTECH), Tanzania
Guavay Company Limited, Tanzania

Commercialization of economically viable leather processing technology for environmental protection and zero waste discharge

Aim: To use novel enzymes from local bacterial isolates for eco-friendly processing of hides and skins

Leader: Francis Mulaa - University of Nairobi, Kenya

Partners:
Green Enzyme Technologies Ltd., Kenya
Makerere University, Uganda
Pwani University, Kenya
Lasting Solutions, Uganda
W.E Tilley Fish Processors, Kenya

Promoting smallholder access to fungal biopesticides through public-private partnerships in East Africa

Aim: To commercialize fungal biopesticides such as insect infecting fungi and plant-colonizing endophytes as potent alternatives to synthetic biopesticides

Leader: Sevgan Subramanian - International Centre of Insect Physiology and Ecology (*icipe*), Kenya

Partners:
Busitema University, Uganda
University of Nairobi, Kenya
The Real IPM Company Limited, Kenya
Kenya Biologics Limited, Kenya
Hottiserve East Africa Limited, Kenya

Integrating ICT and portable bio-based disease diagnostic kits in the commercial production of high quality tissue culture based sweetpotato planting materials in East Africa

Aim: To produce and deliver adequate quantities of quality sweetpotato seed in a timely and cost-effective manner to farmers

Leader: Samuel Kyamanywa - Makerere University, Uganda

Partners:
Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya
SENAI Farm Supplies Limited, Uganda
MIMEA International Kenya Limited, Kenya
Mikocheni Agricultural Research Institute, Tanzania
Rwanda Agricultural Board, Rwanda

Annex 1: List of Participants

	Name	Institution	Country
1	Prof. Venant Nyandwi	University of Burundi	Burundi
2	Mr. Maniragaba Melance	Burundi Eco Magazine	Burundi
3	Prof. Lene Lange	Technical University of Denmark	Denmark
4	Mr. Yifru Tafesse	Ethiopian Agricultural Transformation Agency	Ethiopia
5	Prof. Kassahun Tesfaye	Ethiopian Biotechnology Institute	Ethiopia
6	Mr. Kassahun Bekele	ACOS Ethiopia	Ethiopia
7	Prof. Seyoum Leta	Addis Ababa University, AAU	Ethiopia
8	Prof. Ruth Oniang'o	Rural Outreach Africa	Kenya
9	Dr. Jacob Mignouna	BecA-ILRI Hub	Kenya
10	Mr. Ian Lorenzen	Growth Africa	Kenya
11	Dr. Sunday Ekesi	*icipe*	Kenya
12	Mr. Nathaniel Kyalo Kyenze	Equity Bank Group	Kenya
13	Prof. Henry Bwisa	Jomo Kenyatta University of Agriculture and Technology	Kenya
14	Dr. Philip Osano	Stockholm Environment Institute	Kenya
15	Prof. Francis Mulaa	University of Nairobi (UoN) - Kenya	Kenya
16	Prof. Mathews Dida	Maseno University - Kenya	Kenya
17	Dr. Sevgan Subramanian	*icipe*	Kenya
18	Dr. Samira Mohamed	*icipe*	Kenya
19	Ms. Anna Njui	*icipe*	Kenya
20	Dr. Elizabeth Nganga	*icipe*	Kenya
21	Mr. Brian Mwashi	*icipe*	Kenya
22	Dr. Julius Ecuru	BioInnovate PMO - *icipe*	Kenya
23	Ms. Shira Mukiibi	BioInnovate PMO - *icipe*	Kenya
24	Mr. Abel Anyolo	BioInnovate PMO - *icipe*	Kenya
25	Ms. Nancy Munyeki	BioInnovate PMO - *icipe*	Kenya
26	Mr. Duncan Mboyah	Xinhua News Agency	Kenya
27	Dr. Allan Liavoga	The International Institute of Tropical Agriculture	Nigeria
28	Mr. Georgie Ndirangu	Facilitation Consultant	Rwanda
29	Dr. Marie-Christine Gasingirwa	Ministry of Education	Rwanda
30	Hon. Papias Malimba Musafiri	Ministry of Education	Rwanda
31	Ms. Gertrude Ngabirano	East African Science and Technology Commission	Rwanda
32	Dr. Belay Begashaw	SDGs Centre for Africa	Rwanda
33	Prof. Manasse Mbonye	National Council for Science and Technology	Rwanda
34	Mr. Zephanie Niyonkuru	East Africa Trade and Investment Hub	Rwanda
35	Eng. Ernest MPUNDU	National Council for Science and Technology	Rwanda
36	Mr. Ntizo Senkesha	Rwanda Agricultural Board	Rwanda
37	Sylvia Kawera	Rwanda Environmental Management Authority	Rwanda
38	Dr. Celestin Mutimura	National Agricultural Export Development Board	Rwanda
39	Mr. Jean Bosco Micomyiza	College of Agriculture, Animal Sciences and Veterinary Medicine	Rwanda
40	Dr. Stefan Jansen	College of Medicine and Health Sciences	Rwanda
41	Dr. Niyonzima Francois	Institute of Applied Sciences	Rwanda
42	Dr. Augustine Rutamu	University of Lay Adventists of Kigali	Rwanda
43	Ms. Christine Niyotwambaza	Integrated Polytechnic Regional Centre, Kigali	Rwanda
44	Prof. Beth Kaplin	CoE in Biodiversity and Natural Resource Management	Rwanda
45	Dr. Ignace Kabano	African CoE for Data Science	Rwanda

46	Dr. Dominique Nkunda	Global Agro Concept Ltd, Kigali	Rwanda
47	Mr. Patrick Mutimura	Rwanda's Green Fund	Rwanda
48	Mr. Dharmarajan Hariharan	Sulfo Rwanda Industries	Rwanda
49	Mr. Gen B. Cesar	Rwanda Energy Group Limited	Rwanda
50	E Munyaneza	Institute of National Museums of Rwanda	Rwanda
51	Dr. Hilda Vasanthakaalam	University of Rwanda	Rwanda
52	Mr. Parfait Yongabo		Rwanda
53	Kalisa M Felly	National Council for Science and Technology	Rwanda
54	Dr. Theodore Asiimvue	Rwanda Agricultural Board	Rwanda
55	Mr. Gaspard Swafirayezu	National Council for Science and Technology	Rwanda
56	Mr. Muyunyi N Steven	CNBC - Africa	Rwanda
57	Dr. Barnabe Tujabagira	IPRC South	Rwanda
58	Mr. Uwamahoro Bonaventure	CESB	Rwanda
59	Mr. Yves Irankunda	CNBC - Africa	Rwanda
60	Mr. Richard Ntwari	SDGs Centre for Africa	Rwanda
61	Mr. Jacques Nsengiyumva	WASAC	Rwanda
62	Heve Uqirumukunda	IGIHE LTD	Rwanda
63	Mr. Diogene Mulimdahabi	IPRC, Kigali	Rwanda
64	J D'Amour Mbonyinshua	The New Times	Rwanda
65	Torikumwe J Paul	National Council for Science and Technology	Rwanda
66	Niyonzima Moise	IGIHE LTD	Rwanda
67	Nitae Ali Amuilet	Aluwadcom News	Rwanda
68	Norbert Nyuzahayo	Rushyashya.com	Rwanda
69	Carine Kayitesi	Umwezi.net	Rwanda
70	Hira Andale	NIMEDUC	Rwanda
71	Mr. Kisambri Timothy	The New Times	Rwanda
72	Hakizimana Daniel	Amazing Grace Radio	Rwanda
73	Ms. Marie G Wmuhozariho	University of Rwanda	Rwanda
74	Prof Diran Makinde	NEPAD Agency Industrialization, Science, Technology and Innovation Hub	South Africa
75	Dr. Ivar Virgin	Stockholm Environment Institute (SEI)	Sweden
76	Dr. Claes Kjellstrom	Sida	Sweden
77	Dr. Emilia Molkar	Embassy of Sweden	Rwanda
78	Eng. Dr. Dugushilu Mafunda	Tanzania Commission for Science and Technology	Tanzania
79	Ms Lilian Awinja	East African Business Council	Tanzania
80	Mr. Adolf R Olomi	Banana Investments Ltd	Tanzania
81	Ms. Bertha Mamiro	Tanzania Institute of Research and Development (TIRD) - Tanzania	Tanzania
82	Prof. Karoli Njau	The Nelson Mandela African Institute of Science and Technology (NM-AIST)	Tanzania
83	Prof. Anthony Mshandete	University of Dar es Salaam - Tanzania	Tanzania
84	Mr. Syriacus Buguzi	The Citizen Newspaper	Tanzania
85	Hon. Dr. Tumwesigye Elioda	Ministry of Science, Technology and Innovation	Uganda
86	Dr. Peter Ndemere	Uganda National Council for Science and Technology	Uganda
87	Mr. Erostus Nsubuga	Agro-Genetic Technologies Ltd	Uganda
88	Prof. John Muyonga	Makerere University (MUK) - Uganda	Uganda
89	Dr. Settumba Mukasa	SENAI Farm Supplies Limited, Uganda	Uganda
90	Dr. Dorothy Nakimbugwe	Makerere University (MUK) - Uganda	Uganda
91	Dr. Yusuf Byaruhanga	Makerere University (MUK) - Uganda	Uganda
92	Mr. Wilfred Mwesigye	Ministry of Science, Technology and Innovation	Uganda
93	Ms. Juliet Nabwire	The East African newspaper	Uganda

7.

See

Panelists:

1. Prof. Manasse Mbonye, ES, National Council for Science and Technology, Rwanda
2. Eng. Dr Dugushilu Mafunda, Ag. DG, Tanzania Commission for Science and Technology, Tanzania
3. Mr Erostus Nsubuga, CEO, Agro-Genetic Technologies Ltd (AGT), Uganda
4. Prof. Henry Bwisa, Jomo Kenyatta University of Agriculture and Technology, Kenya
5. Prof. Kassahun Tesfaye, DG, Ethiopian Biotechnology Institute, Ethiopia

Panel Moderator: Ms Gertrude Ngabirano, Executive Secretary, East African Science and Technology Commission, Rwanda

Annex 2: Presentations (Opportunities for developing an innovative-driven bioeconomy)

Please see the drop box link below to access the presentations:
https://www.dropbox.com/sh/gxf6ax9b7ljye7q/AABMCR_gpcy54jjE88dJoOhPa?dl=0

Annex 3: BioInnovate Africa symposium in the media

Articles

BioInnovate Africa Phase II launched
http://www.icipe.org/news/bioinnovate-africa-phase-ii-launched

BioInnovate Africa grants announced
http://www.icipe.org/news/winners-bioinnovate-africa-grants-announced

Innovative commercial products and services from biosciences
https://scienceafrica.co.ke/bio-economy-innovative-commercial-products-services-from-biosciences/

Now stage set for Eastern Africa academia to trade in bioscience
http://www.thecitizen.co.tz/News/Now-stage-set-for-Eastern-Africa-academia-to-trade-in-bioscience/1840340-4183004-h585iv/index.html

Sh31.8 billion regional project to benefit Tanzanian Bioscience innovators
http://www.thecitizen.co.tz/News/1840340-4166808-4bwox6z/index.html

Innovations targeting biological resources get funding
http://www.scidev.net/sub-saharan africa/funding/news/innovations-targeting-biological-resources-get-funding.html

Burundi media
http://burundi-eco.com/developpement-de-bioeconomie-augmenter-production-malgre-changements-climatiques/#.WhaP_ jQ6-1t

Scientist urges Africa to set timelines for ending landfills
http://www.china.org.cn/world/Off_the_Wire/2017-11/10/content_41874640.htm

Tanzania must be proactive in BioInnovate Africa programme
http://www.ippmedia.com/en/editorial/tanzania-must-be-proactive-bioinnovate-africa-programme

Interview with CNBC Africa

https://www.cnbcafrica.com/videos/2017/11/03/bioinnovate-africa-aims-to-boost-crop-yields-through-new-technologies/

BioInnovate Africa

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