

Africa Biennial Biosciences Communication Symposium (ABBC 2021)



ACCELERATING AFRICA'S BIOTECH TIPPING POINT
| Taking Stock and Celebrating the Gains |

Ethiopia | Ghana | Kenya | Malawi | Nigeria | Uganda

#CelebratingGains

#ABBC2021

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Glossary

AATF	African Agricultural Technology Foundation
ABBC	African Biennial Biosciences Communication
AU	Africa Union
AUDA	Africa Union Development Agency
Bt	Bacillus Thuringiensis
CBSD	Cassava Brown Streak Disease
CEO	Chief Executive Officer
COMESA	Common Market for Eastern and Southern Africa
EFSA	European Food Safety Authority
EU	European Union
FGD	Focus Group Discussion
GM	Genetically Modified
GMO	Genetically Modified Organism
ISAAA	International Service for the Acquisition of Agri-biotech Applications
NBA	National Biosafety Authority
NEPAD	New Partnership for Africa's Development
OFAB	Open Forum on Agricultural Biotechnology
USDA	United States Department of Agriculture
USSEC	U.S Soybean Export Council
VIRCA	Virus Resistant Cassava for Africa

Executive Summary

The Africa Biennial Biosciences Communication symposium - ABBC 2021 was the fourth in a series of the bioscience communications symposia, with the first having been held in Nairobi, Kenya in 2015. In view of the COVID-19 travel restrictions, the five-day Symposium applied a hybrid approach that consisted of in-person and virtual participation, with the physical meetings happening in six African countries namely; Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda. The six countries were hyperlinked via Zoom, enabling participants from around the world to join in the deliberations. It was officially opened by Prof. Aggrey Ambali, Head of Science, Technology and Innovation Hub, AUDA-NEPAD Agency, on 20th September 2021.

The ABBC 2021's theme was *"Accelerating the Africa Biotech Tipping Point: Taking Stock and Celebrating the Gains"*. The Symposium brought together six distinct categories of stakeholders namely policy makers, regulators, scientists/researchers, science communicators/journalist, private sector players and farmers, plus a rich array of keynote speakers including two sitting Ministers/Cabinet Secretaries, Members of Parliament and regional leaders from relevant Africa Union establishments. Other than presentations and detailed focus group discussions, the symposium also recognized six outstanding African scientists and launched the African Coalition for Communication about Genome Editing. In total, close to 1500 delegates participated in the 5-day event.

From the deliberations, it was evident that Africa has made progress with seven countries now commercializing at least one biotech crop and several others conducting research. Genome editing was also hailed as an important tool for which Africa should take advantage and be on the forefront in its adoption by employing non-prohibitive regulatory frameworks. There were, however, some challenges, which need to be addressed, key among these, unsustainable political goodwill, disjointed and overlapping regulatory mandates, limited local biotech private sector and gross misinformation.

To sustain the biotech gains and register progress, each of the key stakeholder categories came up with specific measures, which could support access to biotechnology. Policy makers called for closer engagement, especially on the benefits of the technology, while regulators would like to be engaged on issues that are more technical and provided with timely evidence for purposes of risk/safety assessment. Communicators would like to see less scientific jargon and more consistent and proactive messaging that highlights benefits of biotechnology. On their part, scientists called for political will and government support, whereas private sector players are more interested in understanding business opportunities along the biotech value chain, and how they can participate in the production and distribution of biotech products. Farmers on the other hand requested for more involvement in priority setting for biotech research, easy access to affordable biotech seeds and exposure to successful biotech countries through seeing-is-believing study tours and support for farmer-to-farmer sensitization through biotech crops demonstration gardens.

After five days of intensive and extensive deliberations, ABBC 2021 was closed by Hon. Betty Maina, Kenya's Cabinet Secretary, Ministry of Industrialization, Trade and Enterprise Development. In her closing remarks, Hon. Maina appreciated the role of innovations in expanding trade and competitiveness for Africa's agricultural commodities. Specifically, she singled out cotton sub-sector as having an important role in achievement of industrialization as one of the Kenyan Government's Big Four Agenda. The Minister challenged scientists to engage with the public and policy makers more effectively and ensure the populace appreciates the technology's value and potential as new breeding innovations such as genome editing are advancing.

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CHAPTER ONE: **INTRODUCTION**

Background: ABBC in Brief

The ABBC is a platform for stakeholders in, and with passion for biosciences, to actively exchange experiences and best practices towards improving bioscience communications. The Symposium provides an African-based and African-led platform, and plays a fundamental role in addressing pressing communication issues needed to propel biosciences innovations in Africa. The first ABBC symposium was held in Nairobi, Kenya, in 2015, followed by one in Entebbe, Uganda, in 2017 while the third ABBC was held in 2019, in South Africa. One of the most notable success stories of ABBC is the 2019 resolution to initiate Africa's active engagement in genome editing discussions and activities. This has put Africa in pole position on matters of genome editing in sharp contrast to previous technological developments where Africa often played the distant follower.

The ABBC 2021 - Accelerating Africa's Biotech Tipping Point: Taking Stock and Celebrating the Gains

The ABBC 2021 was held on a hybrid (physical and virtual) mode. Case studies from six of the leading biotechnology countries (Nigeria, Malawi, Ethiopia, and Kenya) and two that are on the cusp of commercializing their first biotech crops (Uganda and Ghana) were shared with the global community. This hybrid symposium (in-person in each of the six countries; but internationally-linked virtually), facilitated rich exchange of experiences and strategies for furthering progress in other countries among a wide range of stakeholder groups with an interest in investing in Africa's biotechnology sector. One of the symposium days was dedicated to genome editing where the African Coalition on Communicating about Genome Editing, proposed at ABBC2019, was formally launched.

ABBC2021 Objectives:

1. To share experiences on agricultural biotechnology/biosafety and inspire upcoming countries
2. To synthesize the best communication and policy advocacy strategies for accelerating the region's momentum
3. To take stock of and amplify the successes made over the years and celebrate notable contributions from African scientists
4. To launch the African Coalition on Communicating about Genome Editing, a key recommendation from ABBC 2019



CHAPTER TWO: **SYMPOSIUM PROCEEDINGS**

DAY ONE

INTRODUCTION

The first day of the ABBC 2021 Symposium featured its official opening. In her welcoming remarks, the event's Co-Convenor, Dr Margaret Karembu who is the Director, ISAAA AfriCenter, and also Chair, Africa Life Science Knowledge (ALSK) Hub, introduced the dignitaries and delegates to the symposium. Key notables including the Head of Science, Technology and Innovation Hub (NSTIH) at the Africa Union Development Agency- New Partnership for Africa's Development (AUDA-NEPAD), Prof Aggrey Ambali, Dr. Mahaletchumy Arujanan, the global coordinator of ISAAA, African Agricultural Technology Foundation (AATF) Executive Director, Dr. Canisius Kanangire, and

Dr. Chavonda Jacobs-Young, the Administrator of USDA's Chief Scientific In-House Research Agency, gave their remarks.

OPENING SESSION

Welcoming Remarks

Dr. Margaret Karembu, ISAAA AfriCenter
Director and Co-Convener ABBC 2021



Dr. Karembu welcomed participants to ABBC2021, reminding them that the symposium was being held in hybrid mode – physical in six African countries and internationally connected virtually. Margaret then unveiled the symposium's theme *"Accelerating Africa's Agri-biotech Tipping Point: Taking Stock and Celebrating the Gains,"* and justified why the theme was appropriate by briefly highlighting the region's journey and progress towards adoption of biotech crops.

The fourth in a series, Karembu observed that the ABBC 2021 came at an opportune time when Africa has made significant progress on adoption of biotech crops. As she noted, "this calls for us to take stock, celebrate the gains, and consolidate lessons needed to inspire and propel the continent forward." Karembu also highlighted that the symposium aimed at stimulating deep thinking into what we can do better from the lessons learnt as we move towards adoption of new breeding techniques, key among them genome editing. Concluding her remarks, Dr. Karembu encouraged participants to actively engage and network throughout the Symposium.



Ugandan participants follow the proceedings virtually



This calls for us to take stock, celebrate the gains, and consolidate lessons needed to inspire and propel the continent forward.

Dr. Margaret Karembu, ISAAA AfriCenter Director and Co-Convener ABBC 2021

OFFICIAL OPENING

The ABBC 2021's official opening was graced by several dignitaries in the biosciences space, both from Africa and beyond. It was officially opened by Prof. Aggrey Ambali, Head of Science, Technology and Innovation Hub, AUDA-NEPAD Agency. Out of the high standing personalities present, several others comprising of key decision makers from the six focus countries, joined Prof. Ambali in giving their perspectives during the plenary session on the first day, through a policy dialogue.

Official Opening Remarks: **Prof. Aggrey Ambali**



In his opening remarks, Prof Ambali reiterated AUDA-NEPAD's support for biotechnology in general and genome editing in particular, noting that technology is an additional tool that will enhance precision in breeding. According to Prof. Ambali, achievement of the sustainable development goals requires Africa to embrace and invest in Science, Technology and innovation (STI), including genome editing technology. To this end, the speaker encouraged collaborations to spur creation of the enabling environment.

The participants were also informed that on its part, the AU recognizes the role of science in socio-economic development as underpinned in the AU Agenda 2063 that recognizes Science, Technology and Innovation (STI) as multi-functional tools and enablers for achieving continental development goals. The speaker further elaborated that AUDA has formulated several policies that have forged the continental strategic focus in harnessing biotechnology for socio-economic development. In addition, AUDA has established the Science Technology and Innovation Strategy for Africa (STISA 2014-2024), as well as formed the Africa High Level Panel on Emerging Technologies (APET) to advise the Union on matters of STI. Prof. Ambali cautioned that for the technology to deliver its promise, there needs to be an enabling environment.

Opening Remarks: **Dr. Mahaletchumy Arujanan**



The second speaker was Dr. Maha Arujanan, ISAAA's Global Coordinator based in Malaysia. Dr. Maha lauded Africa for continued growth in number of countries adopting biotech crops. She shared her experience from a Uganda visit where she engaged with farmers who were demanding for Bt cotton seed because they were struggling to make ends meet. Maha showed optimism that by 2025, more African countries would have adopted and commercialized various biotech crops.

Dr. Maha however noted that actualization of all this potential will depend on stakeholders coming together. As a way forward, she encouraged key stakeholders to collaborate and embrace science to support African farmers who require the most efficient tools in farming just as everyone else is striving to have the best technology in the market.

Opening Remarks: **Dr. Canisius K. Kanangire**



The African Agricultural Technology Foundation (AATF) Executive Director, Dr. Canisius K. Kanangire, appreciated the great work and potential of ABBC, pointing out the importance of appropriate communication in uptake of biotechnology. This is particularly important given that the closer Africa moves towards adopting, the more the misinformation is peddled around. In the words of Dr. Kanangire, “we need new approaches to ensure that we are not always forced to defend ourselves but rather run ahead of those who unfairly attack the work we do”.

As technology enthusiasts, we need to determine our own fate by focusing on benefits and creating our own and more appealing narrative. To address the misinformation, Dr. Kanangire emphasized on the need for stakeholders to change the biotechnology communication from “us vs them” debate, to one of projecting biotechnology as a solution that benefits society. Dr. Kanangire also advised against allowing a vacuum in biotechnology communication and called for proactive communication.

Opening Remarks: **Dr. Chavonda Jacobs-Young**



In her pre-recorded speech, Dr. Chavonda Jacobs-Young, the Administrator of USDA's Chief Scientific In-House Research Agency, highlighted the vagaries of climate change, maintaining that the ongoing climate crisis threatens to disrupt food systems around the globe. This will exacerbate food insecurity and disrupt farmer livelihoods, she emphasized.

The speaker shared that the looming crisis may be partly addressed by scientific innovations such as biotechnology. In this regard, Dr. Chavonda stressed the need for all segments of agriculture to come at the deliberations table to jointly develop solutions that reduce carbon emissions and help food systems adapt to a changing climate.

Dr. Chavonda also informed participants that the United States and the United Arab Emirates planned to launch the Agriculture Innovation Mission for Climate (AIM for Climate) whose goal is to increase and accelerate agriculture and food systems innovation in support of climate action. After encouraging Africa to embrace science and better technologies, she noted that successful utilization of the technologies will need a robust and inclusive structure for information and/ knowledge sharing, as well as a reliable and science-based regulatory framework for consistent and efficient decision-making.



We need new approaches to ensure that we are not always forced to defend ourselves but rather run ahead of those who unfairly attack the work we do.

Dr. Canisius K. Kanangire, AATF Executive Director



Bt. Cowpea in Nigeria: A Mini-Documentary

As part of experience sharing, the Symposium screened a mini-documentary about Bt cowpea and the struggle that Nigerian farmers have faced battling the maruca insect pest that causes over 80% crop damage if not controlled. To address this challenge, Nigerian scientists have been researching on a Maruca pod-borer (PBR) resistant Bt cowpea since 2007. These research efforts have borne fruits with the Federal Government of Nigeria approving commercialization of the biotech cowpea under a variety named SAMPEA 20-T.

From the video, ABBC 2021 participants received two important lessons: First, that a robust regulatory system empowers regulators to make impartial and independent decisions that are based on credible scientific evidence. Secondly, a favorable policy environment characterized by government budgetary support is key in research, development and adoption of biotech crops in Africa. Following the two lessons, participants were encouraged to communicate the benefits of biotechnology to their respective governments and policy makers so that financial support may be availed to boost access to biotechnology applications. In addition, regulators should be closely involved in engaging stakeholders throughout the commercialization pathway.



A snapshot of Nigeria mini-documentary. You can watch the video on this link <https://www.youtube.com/watch?v=Fc4PeLcSzqU>

KEYNOTE ADDRESS: **Past, Present and Future Prospects of Biotechnology in Africa**

Prof. Jennifer Thomson, Emeritus Professor in the Department of Molecular and Cell Biology at the University of Cape Town



Prof. Thomson highlighted that in some jurisdictions such as the European Union, biotechnology regulation has not been based on science, thus it would be wrong for other geographies to copy-paste the EU system. This is particularly so given that EU considers herself food sufficient, unlike developing countries, which are generally food insecure.

In her presentation, Prof. Thomson shared that the right political will for biotechnology uptake consists of support for innovation and new technologies, sensible regulations, government's support for research, and promotion of public-private collaborations. Away from political will, Prof. Thomson also picked the persistent misinformation and disinformation about cost and safety of the technology as a key challenge to biotech adoption in Africa.

According to Prof. Thomson, effective communication is essential and should address the public concerns and showcase the benefits of the technology. To foster research and development, the participants were urged to engage government and pursue public-private partnerships.

KEYNOTE ADDRESS: **The Policies and Practice of Genetically Modified Foods in the European Union - Impacts on Africa**

Priscila Quaini Jacobitz, Government Affairs Manager, Crop Life Europe



Reflecting on how Europe handles genetically modified foods, Priscila shared that the EU authorization system for cultivation dossiers of GM crops is dysfunctional with only one authorization of insect resistant maize made in 1998.

Priscila however noted that the EU is a major importer of GM products from Brazil and Argentina, meaning that the EU consumes GM products especially as livestock feed, except that they prefer to import than grow. The presenter further noted that in fact, the EU only produces about 3% of her soya needs while the 97% deficit is met by imports which are GM. EU soymeal imports largely come from the Brazil and Argentina, where GM adoption rate is at over 90%.

On the regulatory front, Jacobitz indicated that the current practice in the EU subjects genome edited products to the same GMO regulatory frameworks, a practice she considered unsuitable for Africa. In particular, the applicable EU legislation imposes a post-market environmental monitoring for each authorized GMO event, with yearly reporting. In addition, traceability and labelling obligations are imposed for any authorized GMO and products derived thereof, in order to provide consumers with information and freedom of choice.

GM food and feed products can only be authorized in the EU if they pass rigorous safety assessment by the European Food Safety Authority (EFSA), which evaluates human and animal health, and environmental safety. The EFSA positive scientific opinion is the basis upon which the European Commission proposes a decision to Member States for the placing on the market of a GMO and products derived thereof.

The Commission's draft decision is voted on under the EU's usual qualified majority rules. When the Standing Committee and the Appeal Committee do not manage to reach a qualified majority for a decision within the given time frame, the Commission takes the decision to authorize the GMOs based on EFSA's positive risk assessment.

So far, for all product cases, despite the positive EFSA assessment, the result has always been a "no opinion vote" by both the Standing and Appeal Committees, leaving the final approval decision to the Commission.

The legislation also imposes a post-market environmental monitoring for each authorized GMO event, with yearly reporting. In addition, traceability and labelling obligations are imposed for any authorized GMO and products derived thereof in order to provide consumers with information and freedom of choice.



Delegates from Ghana participate in ABBC 2021 from Accra

“ As a continent, we still have some sense of ‘silo mentality’ within our scientific institutions. It is time that we come together and consolidate our efforts to ensure the success of the continent’s biotech sector.

Dr Joyce Maling’a, Director, Planning, Performance Management and Quality Control, KALRO



DISCUSSION:

Past, Present and Future Prospects of Biotechnology in Africa

2. The Africa we Want: Role of Biotechnology in Socio-Economic Transformation:

The dialogue aimed at getting perspectives of policy makers on the important topic of “The Africa we Want: Role of Biotechnology in Socio-Economic Transformation”. Representatives from each of the six countries gave their views on the status of regulatory framework, political will, status of biotech commercialization and the prevailing challenges. From the discussions, it was clear that there is a significant level of political will across all the six countries and this has led to the observed progress both in terms technology development and formulation of regulatory framework.

In particular, Ethiopia noted that agri-biotechnology is important for agricultural transformation, a position that was supported by all the other five countries, noting that further delay in adoption of the technology is costly to the continent. This is because of the prevailing challenges such as climate change and population growth, both of which are putting a strain on conventional forms of agriculture and livelihoods globally and particularly in Africa. On the status of regulatory framework, it was established that other than Uganda whose biosafety law, which had been passed, was returned to parliament by the president for amendment, the other five countries have legal frameworks under which commercialization may be conducted.

Regarding the political perspective, all country representatives were unanimous that there is some political will in each of the countries evidenced by the research and commercialization efforts that have been witnessed over the last few years. On this front, Nigeria came out very strongly, sharing that the government financially supported biotechnology development hence triggering additional flow of support from development partners.

In terms of commercialization, four out of the six countries have commercialized at least one biotechnology crop with the exception of Ghana and Uganda, both of which have research at advanced stages.

It was however noted that Africa is still far from where it should be given that only seven out of fifty four countries have approved cultivation yet there are huge challenges faced and basic needs of the people unmet. Participants heard that in some of these countries, it has taken over 20 years to reach the stage of environmental release. This therefore calls upon all stakeholders to work together to reduce such delays. In particular, participants observed that Africa needs to support biotechnology including genome editing by urgently addressing the prevailing policy challenges and more importantly, making regulation affordable to African scientists, lest they be edged out due to unaffordability of approval processes. To make this a reality, policy makers identified the following challenges that should be addressed:

- **Limited public awareness and misinformation:** Policy makers observed that from their perspective, there is still a lot of misinformation and general apathy on matters of biotechnology. To correct this, stakeholders including scientists were asked to communicate to the public in ways that enhance public understanding, acceptance and support for the technology. This should involve the use of simple language and what the science is all about, addressing the concerns raised and projecting the benefits of biotechnology to various categories of stakeholders

- **Low level of Key stakeholder engagement and participation in matters of biotechnology.** It was observed that some stakeholders have not been closely engaged hence not supportive of biotechnology or simply have no forum through which to contribute to biotech development in Africa. It was therefore agreed that every biotechnology initiative should identify, bring on board and actively engage all relevant stakeholders from the beginning to the conclusion of the project. The second solution is to forge inclusive communication platforms to keep the public and policy makers well informed.
- **Limited political will and budgetary support for biotechnology.** This creates over-dependency on donor funding which in turn not only injures project's domestic relevancy and sustainability but also makes biotech appear a foreign and top-down concept that is imposed on Africa. To address this challenge, it is critical that biotechnology stakeholders develop simple and concise statements on how biotechnology fits in Africa's political economy by specifically outlining the contribution of biotechnology to the economy. Such statements should then be used to engage the policy makers and politicians at project conception and convince such political class to allocate substantial resources to biotechnology projects. Domestic investment shows donors the commitment and the need to also invest in such countries. In addition, regional bodies including AU were requested to help fund biotechnology projects in Africa. The third approach is to encourage and establish public private partnerships to support research and technology transfer.
- **Silo mentality among biotech stakeholders:** it was highlighted that many organizations and countries are still stuck in individualistic approaches. This causes duplication, denying stakeholders the efficiency that comes with sharing available resources. In this regard, it was strongly emphasized that individuals, institutional and African countries should seek and sustain well-coordinated collaboration and synergies at all levels of biotechnology development.



Delegates from Malawi pose for a group photo during ABBC 2021



Screening of Malawi Mini-documentary

As part of experience sharing, the symposium screened a mini-documentary showing how Malawi has moved through the process of commercializing insect resistant Bt. cotton. From the documentary, participants were able to learn the challenges that Malawi went through, their current experience with Bt cotton and the expectations from the sub-sector value chain actors. It was clear that performance of Bt cotton depends on strengthening every part of the chain from timely access to Bt cotton seed, that can be made possible through empowering local producers, good extension and agronomic management packages, improving collection and delivery mechanisms to ginneries, modernizing ginneries and exploiting the by-products, which form 65% of the whole cotton crop.



A snapshot of the Malawi Bt cotton documentary. You can watch the full documentary via this link <https://www.youtube.com/watch?v=BFOwcsRbcWg&t=18s>

DAY TWO

Introduction

The second day of ABBC 2021 symposium was characterized by highly informative and change-making deliberations from leading policy makers, scientists, and Science journalists and communicators. The day started with a plenary session that was graced by Hon. Kyakulaga Fred Bwino, the Uganda Minister for Agriculture. The other dignitary from Uganda was Hon. Dr. Elioda Tumwesigye, Former Uganda's Minister for Science, Technology and Innovation. The media fraternity was represented by Diran Onifade, (Editor-in-Chief, AfricaSTI), while the Open Forum on Agricultural Biotechnology (OFAB) was represented by Vitumbiko Chinoko, (Project Manager, OFAB). Other than the plenary sessions, the day had two focus group discussion. The first FGD was for the policy makers to discuss policy level issues before giving way for communication to engage in matters of science communication.

Policy Makers Session



Key Note addresses: The Politics of Genetically Modified Foods: An African Perspective

Hon. Dr. Elioda Tumwesigye, former Minister for Science, Technology and Innovation, Uganda



Hon. Elioda Tumwesigye started the keynote address by introducing the connection between politics and technological development; first noting that politics involves getting and keeping government power. He then advanced his position by looping in political economy, which he says, covers matters of wealth creation both at domestic or international, including of commercial interests of any country.

This introduction served to highlight the fact that each country or government moves according to the needs of that particular government. Alluding to the needs of Uganda and indeed Africa as a whole, Dr. Elioda pointed out the high population of Africa, which has challenges such as food security, health, environmental issues and the climate change related constraints. With the stage now set, the presenter emphasized the role of science and technology to address the myriad of challenges facing Africa. In particular, he noted that genetic engineering can be applied to improve livestock disease resistance, reduce use of chemical sprays and solve some of health problems facing the continent. Dr Elioda's position fits very well in the rapidly growing narrative on the need to communicate the benefits of biotechnology.

Cognizant of the biotechnology opposition, the speaker admonished the anti-biotech forces which he noted that they are mostly based in Europe and America but keep injecting negative energy and misinformation into biotechnology processes in Africa. To address such negative influence, the former Minister noted that media is an important player in changing the narrative. However irrespective of the challenges, Ugandan scientists have continued with research on crops such as bananas and cassava which are important crops to the country. In relation to the challenges in the regulatory framework, Hon Tumwesigye was optimistic that there is also political will and commitment from the President of Uganda and believes that is a matter of short time before the Ugandan law is enacted. In conclusion, the policy maker guided that biotechnology discourse is a matter of political economy and should be handled as such.



Hon. Kyakulaga Fred Bwino, State Minister for Agriculture, Uganda

The minister appreciated the efforts by science communicators and encouraged forums such as ABBC to continue creating avenues for science communication. Zeroing in on Uganda, the minister noted that Uganda has the critical mass of human capacity and top-class infrastructure at research centers to enable the country exploit the science of biotechnology. The minister also conveyed government's appreciation of the efforts by Ugandan Scientists in addressing agricultural challenges. To boost the scientists' efforts, the minister pointed out that the government is very much committed to creating an enabling environment that is conducive for exploiting biotechnology.

However, as a pointer to the current the status of regulatory environment in Uganda, the minister expressly informed the world that Uganda is moving consciously and cautiously. On a rather positive note, he believes that given the increment in the number of African countries that have adopted GMOs, from one 25 years ago to the current seven, Uganda will soon join. Going specific to the status of the Ugandan biotechnology law, the Minister indicated that the president returned the bill due to procedural issues as well as other areas that were not very clear. It is therefore expected that the bill will be tabled in the current parliament. Hon. Bwino concluded by reiterating government's commitment to create an enabling environment for exploitation of the benefits of biotechnology.

After the two presentations, participants responded through comments and questions. First, participants wanted to know the challenges that Uganda has faced in biotech development and the lessons learnt from such challenges. In response, the participants were advised that from Uganda's perspective, making legislations takes a lot of time. These therefore implies that countries seeking to enact a biotechnology legislation should be prepared to invest more efforts and time. The second issue raised was how the country planned to make use of the available capacity yet there is no law in place. To this, Uganda responded that the law will soon be in place, especially now that neighboring countries are starting to commercialize.

This is an important pointer to ensure that African countries that commercialize biotech crops go on to actually succeed and show success stories. A positive story will motivate other countries while a negative commercialization story may just do the opposite. Other issues raised touched on the fact that the Ugandan Biotechnology Bill will have to be introduced to parliament as new business. the Minister however informed participants that despite introducing the bill as new, the consultations and consensus that had been built in the last parliament will remain applicable and useful. On the concerns raised about liability clause, the minister is optimistic that consultations and dialogue will deliver an appropriate way forward.



Ugandan delegates participate in ABBC 2021 from Kampala, Uganda



Policy Makers Focus Group Discussion:

Enabling Policies and Actions for Supporting Africa's Biotechnology Development

The policy makers FGDs were held concurrently in each of the six participating countries and were guided by harmonized lines of inquiry to which policy makers responded. The first line of inquiry discussed was public perception of biotechnology. This was followed by policy makers' perception on what exactly affects adoption of biotechnology. The third aspect was what each country has so far done to address hindrances to biotechnology adoption and the last was how the public participation in matters of biotechnology could be enhanced. The responses and country-level discussions thereafter were documented by the Country FGD chairperson and shared with all participants via Zoom. From the discussions, the following perspectives were noted:

Perceptions of Agricultural Biotechnology

Generally, the perceptions are negative with only some shades of positive perception on specific technologies and countries. In terms of specifics, the policy makers observed that:

- Biotechnology is generally seen as scary and is considered a top-down concept that is being pushed to the people and led by foreigners whose agenda is to wipe out indigenous crops.
- Biotech products are of inferior quality and lacks the attractive taste.
- Scientists are crossing boundaries of nature and venturing into the spaces naturally regarded as God's purpose.

On the positive side, there is demand among farmers for specific technologies such as cassava, cotton and banana for which farmers believe (and have started experiencing) biotechnology benefits. From research perspective, it was noted adequate capacity exists to deliver homegrown GM products and ensure those approved are safe for food, feed and the environment.

Factors that affect adoption of agri-biotechnology in Africa

On this issue different countries had varying responses. For Kenya, adoption of agri-biotechnology is largely affected by the overlapping mandate in government ministries, misinformation and ban on GM imports that has negatively affected biotech uptake. Lack of readily available seed is also a hindrance to biotechnology adoption because some farmers interested in the technology cannot easily access the biotechnology seed hence go for what is available. In addition, inadequate financial investment from the government. For Uganda, the FGD revealed that absence of the law is the main constraint but stratification of the society with diverse interest groups such as religious leaders and politicians is also a challenge against adoption because it creates destructive forces of push and pull. Limited awareness and lack of capacity among scientists are also important factors especially in Malawi. Reporting by untrained journalists is yet another factor that lead to misinformation, consequently derailing biotechnology adoption.



Delegates from Nigeria pose for a group photo in Abuja

Efforts to mitigate biotechnology adoption constraints

The discussions conclude that different countries have continued to address adoption obstacles in different ways. In Kenya, it was noted that there have been several positive steps such as partial lifting of the ban on GM imports, government funding for the purchase of Bt. cotton seed and establishment of cotton seed development committee based at KALRO among other initiatives. On her part, Malawi has made several steps as well. To enhance understanding and support for biotechnology, Malawian Policy makers have participated in field visits to appreciate how Bt. cotton is performing. In addition, Cotton Council of Malawi has a Task Force that was educating key stakeholders on benefits of Bt. cotton. Uganda has continued demystification of biotechnology through seeing-is-believing events while continuing with research. Nigeria's efforts have included enactment of the Biosafety Law, development and validation of genome editing regulations as well as evaluation and commercialization of biotechnology crops such as cowpea and . Ethiopia has on the other hand effected declarations that continue to guide biotechnology development in the country.

Enhancing public participation in GMO issues.

All countries indicated the need for appropriate communication and stakeholder inclusivity. Some of the specific recommendations included the need to have a biotechnology week to create awareness and engagement in biotechnology. The other recommendation was to have dedicated biotechnology spokes persons who may serve as sources of credible information as opposed to everyone speak on matters of biotechnology. Such a move is expected to enhance consistency in messages and further boost acceptance. The need to communicate the benefits of biotechnology was also highlighted as an important intervention. This could be communicated through local media, social media as well as face-to-face engagement with policy makers to win government support.

Science Journalists and Communicators Session



Balancing Science Stories: The Challenge of False Balance.

Diran Onifade, Editor-in-Chief, AfricaSTI, Former Vice President, World Federation of Science Journalists

Diran addressed the art of Balancing Science Stories and the Challenge of False Balance. Diran observed that whereas journalists are wired to have an accurate and balanced story, in trying to achieve the balance, science journalists' mess up the story by trying to get a different side of science. As a very experienced science editor, Diran advised science journalists that reporting science is different from the general coverage.

For science, there is only scientific consensus. This means that if a science journalist is looking for the balance that is opposed or contradicting the scientific consensus without any new scientific research findings to the contrary, then that is simply wrong for it provides a false balance. There is, however, a challenge when journalists take stories to the editor and the story lacks robustness because the reporter only interviewed one person. As a way forward, it is better to embrace variety rather than balance or look for the other side. To achieve the variety and enhance robustness, it is better to talk to various scientists along the value chain so that there are different voices but from relevant people that can give the right vocabulary.

“ In science reporting, there is no other side to a story. If there is another side to a story, then there's still nothing to report. Consensus is key in achieving good science reporting.

Diran Onifade, Editor-in-Chief, AfricaSTI



Effective Biotech and Biosafety Communications: Lessons from the Open Forum on Agricultural Biotechnology (OFAB) in Africa

Vitumbiko Chinoko, Project Manager, OFAB

The growth in number of chapters is expected to create more space for various stakeholders to engage in biotechnology to prevent an “us vs them” scenario. Participants heard that currently OFAB is pursuing policy change and policy implementation among other objectives. From the pursuit of these objectives, OFAB has learnt several lessons:

- i. **The importance of credible champions:** investing into quality champions is important because the messenger is equally important.
- ii. **Issue management:** the stakeholders should be strategic in choosing which issue to respond. It is better to be offensive by creating own narrative instead of getting defensive.
- iii. **Need to consistently be present and engage:** biotechnology teams should always engage the relevant stakeholders. This could be achieved by regular provision of information on biotechnology. He noted that nature generally abhors a vacuum so any information vacuum may be negatively exploited by those opposed to the technology.
- iv. **Biotechnology should remain people focused:** it is important to project what the technology can do at personal level, whether it is to policy makers, farmers or other stakeholders.
- v. **Projection of success stories:** there is need to amplify the success stories especially in terms of what biotechnology can do to improve the economy and other benefits.



Biotechnology touches on the lives of the common people and hence should be made about them. Make the most out of biotech success stories. Show the public how biotech is positively impacting on the lives of the normal people.

Vitumbiko Chinoko, OFAB Project Manager



Journalists and Science Communicators FGD:

Collaborating Towards an Informed Citizenry through Effective Biotech and Biosafety Communications

The session was conducted through three key questions; first on effectiveness of media coverage, the second was on how to get the public to understand and experience biotechnology and lastly, what journalists and science communicators can do to enhance public understanding. After deliberations, each country made a presentation of their findings to plenary through zoom connectivity. From reports obtained, science journalists and communicators highlighted the following in responses to the key questions:

Reflecting on current coverage, how would you rate its effectiveness?

Different countries rated effectiveness of their communication programs differently. From Ethiopia that scored its program at 10% effectiveness to Kenya that considered herself at 65%, all countries indicated success, challenges and recommended way forward. What was very important however was that each country had achieved some progress, courtesy of the communication initiatives. Some of the factors affecting effectiveness were highlighted as follows:

- There is need to articulate biotech matters better to avoid negative perceptions.
- The coverage is effective in the sense that it has stimulated public debate. This however needs to be enhanced given the misinformation that still flies around and the largely negative public perceptions.
- Journalists may do good stories but the editors may not quite understand the important components hence may drop the story.
- The need to master the art of repeating the benefits of technology to allow the public internalize the message.

Getting the public to know and experience technology

Journalists identified a number of communication issues that limit public understanding of biotechnology. From journalist's perspective, all stakeholders have weaknesses to address and role to play. For example, researchers and scientists were asked to contribute to editorials to enhance accuracy and reliability of biotechnology information that goes to the public. Still on accuracy, journalists, sub-editors and editors need training to familiarize themselves with key terms, pictorials and imageries that perpetuate negativity about the technology as well as important narratives that need to reach the public.

- There should be authoritative resources/spokes persons because the journalists would like to only report newsworthy stories.
- It is good to respond to anti-biotech stories in real time otherwise the falsehoods become the truth.
- We should keep giving out positive messages to avoid getting drowned into misinformation
- There is need to project user/beneficiaries' voices especially now that several countries are at commercialization stage
- Empower the farmers so that when journalists meet them, they have the right messages and are adhering to good stewardship measures.
- Train extension workers for them to communicate to the famers and train them on stewardship
- Creating a visual data bank for journalists to access experts and use in their stories



Ethiopian delegates during ABBC 2021

The role of journalists and communicators in improving public understanding of agri-biotech

Given the less than optimal level of effectiveness of media coverage in enhancing biotechnology adoption, journalists and communicators came up with a number of strategies that could improve the situation in Africa. The group recognized the need to target the political class since they are influential and their word influences a significant size of the public. The second strategy was a review of messages to make them simple and to focus more on the benefits of the technology and where appropriate use vernacular language. The trained journalists were also encouraged to proactively do editorials, features and analytical pieces in collaboration with scientists and subject matter experts. Other recommendations included:

- Importance of building capacity of specialized science reporters so that they can do more on biotech acceptance.
- Regularly populating biotech news from various radio and TV stations.
- Journalists must be proactive to look for biotech news from experts

At the end of the sessions, a question was raised on how the voice and support of politicians can be secured. In response, the stakeholders were advised to engage and involve politicians right from start of biotechnology projects. It is important for such politicians to also understand the benefits in the technology for the country so that they don't become suspicious later in the process.



Ghanaian journalists pose for a photo at the ABBC2021

DAY THREE

INTRODUCTION

The third day of the symposium had three key sessions. The plenary featured presentations touching on the regulatory systems and policies affecting biotech products. The next session featured two focus group discussions, as well as question and answer sessions. Lastly, the session saw the recognition of outstanding biotech scientists who have excelled in the technology in each of the six focus countries.

Regulators' Session



The Global and Africa policy and regulatory perspectives of genome editing

Dr. Rufus Ebegba, Director-General/CEO NBMA, Nigeria



Dr. Rufus Ebegba, Director-General/CEO, National Biosafety Management Agency, Nigeria and Chair, Africa Biosafety Regulators Forum opened the day by presenting on “Global and Africa Policy and Regulatory Perspectives of Genome Editing”. Dr. Ebegba noted “gene editing is now much easier, faster, cheaper and more versatile than ever, given the available tools”.

Dr. Rufus also highlighted the importance of genome editing which include nutritional enhancement, adaptation to environmental stress and efficiency in plant breeding. The speaker however noted that despite the many benefits, the technology still needs appropriate regulatory framework, just like other technologies. In this regard, it is the hope of scientists that regulatory regimes will focus risk assessment efforts on the resultant products rather than the technology applied (process). For Nigeria, genome editing governance provides for case by case assessment of regulatory status, though foreign-DNA free gene edited crops are not subjected to GMO regulation.

Dr. Rufus informed participants that consultations within Africa Union are proposing more enabling and science-based approaches to emerging technologies such as genome editing. The speaker further noted that several African countries are at different stages of formulating gene editing regulatory frameworks with Nigeria, Kenya and Eswatini taking lead given their status of genome editing regulatory frameworks. Using Nigeria as an example, Rufus noted that in 2019, Nigeria revised her 2015 biosafety law to include gene editing. Still on Nigeria, he pointed out that “if the gene editing process or the gene edited product does not lead to, or have a new combination of genetic material (e.g. does not use a transgene or /uses a transgene which is removed in the final product), a non-GM regulatory classification is applied”. In conclusion, Nigeria uses both Process- and Product-trigger Gene Editing regulatory approach.

Speaking about the challenges bedeviling African regulatory and policy development, Rufus indicated that regulatory frameworks have not been able to keep pace with fast scientific advancements. To facilitate development and implementation of appropriate genome editing regulations, he identified the following issues that need to be addressed:

- New technologies not fitting into old regulatory definitions and paradigms.
- Lack of harmonized definitions and laws.
- Lack of public understanding and trust.
- Lack of regulatory certainty for developers.
- Limited political will.



Regulators Focus Group:

Effective coordination of Biosafety regulations at the national and regional level

Plenary: Insights from Kenya by Prof. Dorrington Ogoyi



The session began with Prof. Dorrington Ogoyi, the CEO of Kenya's National Biosafety Authority, sharing his experience. Prof Ogoyi highlighted that the National Biosafety Authority (NBA), engages experts in the decision-making process but the Board has the final decision on applications. In addition, there are other regulatory bodies that NBA works with in reaching the biosafety decisions. However, in light of the ban on importation of GMOs into Kenya, Cabinet sanction is required in some decisions.





Summary of Regulators focus group discussions

Each of the six countries held separate in-country discussions based on three key questions. The first question required regulators to identify what they considered as their country level strengths in the decision-making process. The second question was on challenges and appropriate remedies while the third question sought regulator's suggestions on how to enhance harmonization of regulatory frameworks in Africa. After discussions and consensus building, the summary of final positions was shared with the rest of participants from other countries and online guests. It was noted that countries had both similar and different perspectives as summarized below.

Main strengths towards biosafety decision-making

As far as strengths are concerned, three key drivers stood out: first was availability of Science-based regulatory framework. This appear to be the backbone of any decision-making process as it provides an objective way of assessing applications and delivering the required decisions within the stipulated time period. It makes the process more predictable not only to the decision maker but to applicants as well. The second strength identified was the political will, which the groups observed that it not only allows regulators to make decisions unimpeded, but also avails the support needed including operational budgets.

The third strength identified was presence of adequate regulatory capacity in terms of infrastructure and personnel. It was noted that having access to appropriately qualified personnel is important because it injects confidence in the regulators. Availability of collaboration and coordination mechanism among regulatory agencies in any country was also seen as a strength for the regulators. Important to note here is that at the moment, not all the countries may have each of the strengths but these are the drivers that are contributing to the success being observed in particular countries.

Regulatory challenges and possible solutions

The regulators identified a list of challenges and provided suggestions on how such challenges could be addressed. A review of responses from each country revealed that Africans share fairly similar challenges which gives an opportunity for close collaboration. The various challenges and suggested solutions are provided in the next section.

- **Restrictive and costly biosafety regulatory framework:** African policy makers and regulators were alerted of the looming danger of excluding African scientist from developing and commercializing Africa-relevant products due to costly regulatory requirements. Instead, the regulators were advised to restrict themselves to scientific risk assessments that focus on the safety and relevance of the product rather than the process.
- **Overlap in regulatory mandates:** despite presence of institutions designated to biosafety, many other institutions have amended or interpreted their mandates to also cover biosafety. This overlap continues to be a challenge in many African countries where different ministries and departments of government have some say on matters of national biosafety. To address the challenge, it is important to establish a biosafety coordination mechanism that draws clear boundaries for each institution or provides for efficient consensus building for decision-making.

- **Lack of harmonization:** Many African countries and regulatory have held to their guns as far as wanting to undertake separate, and in most cases additional safety assessment is concerned. There is limited data and by extension decision portability within and across countries, including those bordering reach other. For the sake of reaping the benefits of biotechnology, it is important that laws and regulations are harmonized within nations and institutions through dialogue to identify and correct specific areas of contradiction. For regional laws, it was suggested that regional bodies such as COMESA should form part of the entry point for regional harmonization. In addition, there should be data portability as well as joint assessment to avoid duplications. It was also recommended that regional biosafety bodies should as a matter of urgency initiate the harmonization process.
- **Ambiguity in some parts of the law:** some biosafety laws contain unclear provisions, an example here being “the need for adequate public participation”. It is not clear what constitute adequate public engagement for the purpose of fulfilling the requirements of the law. To solve the issue, concerned stakeholders need to come up with a way of determining what level of public participation is adequate. The Biotechnology stakeholders could convene a workshop to discuss and agree before some entities start challenging the matter in courts of law.
- **Low public understanding:** the level of public awareness and understanding is still very low. This limits the effectiveness of public participation in decision-making. The stakeholders were therefore urged to enhance their efforts towards biotech awareness by developing and implementing communication strategies. The biotech partners could assist by helping to develop or review country level biotechnology/biosafety communication strategies and/or plans.
- **A looming threat to push genome editing down the prohibitive regulatory path taken by GMOS:** Although genome editing does not always involve combination of novel genetic material to constitute a GMO going by the definition of the Cartagena Protocol, some countries have gone ahead to treat it as GMO and subjected genome editing to GMO regulatory approval. The regulators were guided to assess genome editing applications on a case by case as exercised in Nigeria. Absence of combination of novel genetic material should exempt the application from biosafety regulations done on GMOs. However, in the interest of public safety and confidence, the product should still be subject to other safety and approval requirements.
- **Low levels of funding:** lack of funding especially internally limits the level of engagement. Regulatory institutions should therefore seek partnerships and collaborations for resource sharing and cost reduction. Regional bodies such as AU were also asked to financially support the regional biotech and biosafety initiatives in Africa.

Fast-tracking regional harmonization of biosafety regulatory processes

Despite the opportunities for collaboration given similarities in changes and aspirations, lack of harmonization in regulatory regimes has made collaboration efforts a nightmare for regulators and other stakeholders. Fast tacking regional harmonization of biosafety regulations is hence an important and urgent consideration for Africa moving forward. To unlock this opportunity, regulators came up with a set of proposals, which if implemented could contribute to better access to biotechnology in the region.

First, the regulators were unanimous that there is need to harmonize Africa’s legal frameworks to ensure that the pertinent commissions work on one platform. To facilitate this, regional biosafety agencies need to meet and initiate deliberations on harmonization. The regulators alerted themselves of similar processes that have been started within different institutions e.g. COMESA. Such ongoing efforts could therefore be an important entry point for harmonization of biosafety regulations.

The other key suggestion made was the need to synchronize regulatory/approval data from different settings across the region and use it in the harmonization process. For instance, for the VIRCA Plus project (GM Cassava), the trials were done in both Kenya and Uganda so sharing such data would be important. Collecting and collating biosafety data in the different involved countries could facilitate the fast-tracking of harmonization process for it would show how similar or different these sets of data are and why one country may or may not rely on data from a neighboring country.

Case Study:

Coordination of Biosafety Regulatory System – Experiences from a Technology Developer

Godwin Lemgo (Regulatory Scientific Affairs Manager – Africa, Bayer Crop Science)



Godwin appreciated that Africa agriculture has come a long way and modern biotechnology plays a critical role in achieving the successes that have so far been achieved in this sector. He observed that while modern biotechnology may not be the silver bullet in addressing all the challenges that affect agriculture productivity in the continent, it plays a key/significant role in addressing most of these challenges. For 25 years, biotechnology has been offering promising solutions to challenges across the world.

Godwin however regretted that despite biotechnology being beneficial, there still appear to be barriers against adoption of this technology, raising the all-important question of why Africa appears to be afraid of the technology, despite it working elsewhere. From Godwin's perspective, lack of political goodwill and unfavorable public perception are among the biggest hurdles facing biotech adoption. The public also appears to have distrust for science. Other challenges include unpredictable regulatory systems that often cause delays in the adoption of new technologies.

The speaker also noted that some governments could be avoiding harmonization of biosafety regulations for fear of losing sovereignty or independence in decision-making. To this, Godwin guided that there are pathways for regulatory harmonization that do not compromise sovereignty such as joint/ simultaneous safety assessments, recognition of decisions from other jurisdictions and regular sharing of experiences.

“While modern biotechnology may not be the silver bullet in addressing all the challenges that affect agriculture productivity in the continent, it certainly plays a key role in addressing most of these challenges.

Godwin Lemgo, Bayer Crop Science Regulatory Scientific Affairs Manager for Africa

SCIENTISTS/ RESEARCHERS' SESSION



Opportunities for strengthening global agri-biotech research collaboration

Dr Marc Heijde (Program Manager, International Plant Biotechnology Outreach Division (IPBO), Flemish Institute of Biotechnology (VIB))



Dr Heijde stressed that modern science and technologies continue to create and present new opportunities for research and education in Africa. Technologies such as biotech, create opportunities that could be further developed in Africa by Africans in partnership with the global community to among other things, integrate the circular economy into laboratories, increase Africa's laboratory infrastructure to allow for practical education at the universities, and develop new scientific service bioeconomies.

In addition, there are opportunities to build capacity now and for the next generation. Such opportunities include the Open-Door Fellowship Program (ODFP) for women researchers in Africa. The fellowship program seeks to enhance scientific visibility, increase funding and research collaborations, provide conducive working environment and offer peer support and mentoring Network to the participants.



Delivering Africa's First Biotech Food Crops: Lessons from Resistant Cassava

Prof Douglas Miano, VIRCA Plus Kenya Lead Scientist



Prof Miano, introduced the VIRCA Plus project, indicating that the goal of the project is to develop and deliver a cassava variety that is enhanced with resistance against viruses. The effort to save cassava from the disease is considered worthwhile because cassava is a resilient crop that has good prospects as an alternative food security crop, yet the Cassava Brown Streak Disease (CBSD) has proved to be a major problem, causing up to 100% damage to the crop. In view of this menace, Prof. Miano was delighted that CBSD is now manageable using modern biotechnology.

Miano assured participants that the GM cassava portends many benefits for farmers, processors and consumers. Prof. Miano further noted that research has proved that CBSD-resistant cassava is safe as all the requisite studies were conducted on it by regulatory bodies before its approval.

In terms of project activities, VIRCA Plus project integrated four key areas namely Science, Regulatory, Communication and capacity building. In this regard, trait discovery was conducted between 2008 and 2014. This was followed by submission of the dossier to the national Biosafety authority in 2020 and approval for environmental release for conducting national performance trials was granted in 2021.

As evident, the project has taken more than a decade to reach its current status. According to Prof. Miano, this apparent delay was caused by a number of challenges such as resistance to the technology by the public and involvement by many institutions which made it difficult to keep timelines due to the back and forth between these institutions. The other challenges were the competing interests from the different stakeholders and the overlaps in different laws and regulations.

From the activities implemented, challenges faced and victories recorded, Prof. Miano distilled a number of lessons which he shared with participants. Importance of a multidisciplinary team of experts is one of the lessons learnt. According to Prof. Miano, the team should include the technical, regulatory and communication experts to help the project effectively overcome related challenges. Focusing on project goals is another lesson shared. In view of the challenges, it is important to pursue the goals without distraction; otherwise, the project may run into a halt. Consistent involvement of regulators also proved important for the progress of the project as it keeps such regulators informed of every step. The other critical lesson shared was that availability of resources is key. Project activities requires resource flow to achieve so appropriate funding is required of project goals are to be achieved. Also important is regular consultations and having an effective communications strategy.

Delivering Africa's First Biotech Food Crops: Lessons from Bt Cowpea

Prof. Mohammad Ishiyaku, the Bt Cowpea Lead Scientist



Prof. Ishiyaku Nigeria shared the Nigerian experience in the development of cowpea in Nigeria. The participants were informed that Nigeria is the largest producer of cowpea in the world and the leading consumer of the crop. The problem is that maruca can cause over 80% loss. Farmers have tried insecticides but such insecticides are not only expensive and unaffordable but can also be harmful if not well handled.

It was further observed that the variety that was used in the transformation was the smoothed seeded, which is not the most popular variety so there was need for backcrossing the trait to the more preferred varieties.

Since the approval of the GM cowpea, the country has so far produced about 20-30% of the seed volumes needed. As part of expectation management, the Bt cowpea team made it clear that the technology can only work against maruca and NOT other insects. Thus, to deploy the technology and make it more available, the best way is to engage seed companies. In terms of lessons learnt, the presenter noted the following as important:

Close engagement of the regulators: this makes them understand the details of the technology from the word go so to reduce the back and forth questioning because they will already have some of the information they may be looking for.

Importance of local seed production capacity: The demand for the seed is very too high compared to the expectations. Given the difficulties that farmers have faced with conventional varieties, demand for Bt seed is high compared to demand. This calls for enhancing capacity of seed production.

Importance of farmer inclusion: it has been learnt that carrying along farmers makes them understand what exactly is happening. This helps to lower suspicion and enhance acceptance.



While the cowpea has other insect pests even at its vegetative phase, they are not as destructive as the maruca pod borer. It destroys the flower buds and the flower, as well as the developing pods, and also the developed pods, spoiling the grain quality.

*Prof. Mohammad Ishiyaku, Exec Director IAR/
Principal Investigator, Bt Cowpea, Nigeria.*



Focus Group Discussion (FGD) 2:

Scientists/Researchers.

The second phase of researchers' session was structured in the form of focus group discussion. The FGD was guided by a checklist of three questions, which were discussed by researchers and scientist in each of the six countries with contributions from online participants. The first issue was the policy and institutional issues that enhance biotechnology research. In response, researchers identified good linkages and networking, multidisciplinary research initiatives, support from the government and harmony among regulatory agencies as the key enablers of biotechnology research.

The second issue discussed was the policies and institutional issues that stifle biotech research. On this, researchers noted poor communication, lack of research funding, overlap of regulations, and costly regulatory frameworks as key impediments to biotechnology research. The third question was on barriers that limit public engagement by scientists, and which areas need more attention as far as public engagement is concerned. Researchers responded that engaging the end-users of the products has been slow, thus should be mainstreamed. Secondly, gender and cultural issues are hardly put into consideration during the engagement processes so some key members of the public are left out. Technical jargon is another barrier to public engagement, so projects should always have good communication strategies and programs that simplify the language. Low level of literacy among end-users is also an issue that require attention such as use of vernacular language where possible.

The last question discussed was how Africa should prepare its next-generation researchers for bioscience innovations. Researchers from the six countries had several suggestions such as including a capacity building budget component in grant proposals to enable students and young scientist to be incorporated into research projects. International collaborators and partnerships to share facilities and resources may also help to bring up scientists. It was further recommended that developing bio-entrepreneurship will also provide opportunities for next generation of scientists to engage in matters of bio-entrepreneurship.. Introducing biotechnology in school curricular will also help inspire biotechnology to students and cultivate interest.

Recognizing scientists/ researchers in the six focus countries



Dr. Margaret Karembu led the recognition of six scientists who have shown commitment to the development of biotechnology in Africa. In the interest of encouraging scientists to continue with the good work and enhance commitment from other science stakeholders, the ABBC found it fit to recognize scientists who have excelled in pushing forward biotechnology development in their various countries. To achieve this, ABBC2021 involved country level committees to nominate and select the awardee using a predetermined criterion that included considerations such as commitment to the scientific course, proactiveness in the media and release of a product.

In the event presided over by the Chair of Africa Union's African Scientific, Research and Innovation Council Prof. Ratemo Michieka, ABBC 2021 recognized the following scientists:

Ethiopia

Dr Tedesa Daba



Dr. Daba is the Director at the biotechnology Research Directorate of Ethiopia Institute of Agricultural Research. He pioneered research and commercialization of Bt cotton

Ghana

Prof Marian Dorcas Quain



Prof. Quain is a renowned biotechnologist that has worked on numerous crops with focus on the utilization of tissue culture for production of clean planting materials. She worked on protein-enhanced GM Sweetpotato but lacked funding to deliver the product

Kenya

Dr Charles Waturu



Dr Waturu is a retired Director of Horticultural Research Institute and holds a PhD in crop protection from the University of Reading, UK. He led and pioneered research and eventual commercialization of Bt cotton, that took close to 20 years!

Malawi

Prof. James Bokosi



James Bukosi is a professor at the Lilongwe University of Agriculture and Natural Resource and the Chair of the Agriculture and Natural resources committee of the national Commission for Science and Technology in Malawi. He pioneered research and commercialization of Bt cotton in Malawi

Nigeria

Prof. Mohammad Ishiyaku



Prof. Mohammad Ishiyaku is the Executive Director, Institute for Agricultural Research at Ahmadu Bello University. He was the Lead Scientist in research and development of Bt cowpea and pioneered commercialization of the Maruca-resistant cowpea)

Uganda

Dr. Tushemereirwe Wilberforce



Dr. Tushemereirwe is a banana breeder and currently the Director of Research at the National Agricultural Research Laboratories at NARO. He pioneered research on GM Banana and is fondly referred to as the Father of Banana research in East Africa.

As part of the appreciation, each of the six recognized scientists were gifted a certificate and newly launched book GM Crops and the Global Divide by Prof Jennifer Thomson.

DAY FOUR

INTRODUCTION

The fourth day of the symposium featured two key sessions; one for the private sector and the other for the farmers. Each of these two sessions had two plenary presentations as well as a focus group discussion. The presentations highlighted the prospects for biotech enterprises in Africa -in which the focus was Bt cotton- as well as opportunities for international trade in GMOs, which featured the case study of US Soybean.

PRIVATE SECTOR'S SESSION



Plenary Session: Opportunities for Biotech Enterprises in Africa.

Joshi Kaustubh, the Cotton Business Lead at the Maharashtra Hybrid Seeds Company (Mahyco)



Joshi observed that Africa's population continues to grow and at a fast pace, requiring more food production from fewer farms over the next decade due to land fragmentation and competing uses such as urbanization. Josh also noted that African has not recorded any significant improvement in crop productivity over the last 10 years.

According to Joshi, the stagnation in productivity could be positively impacted by use of fertilizer, pesticides, improved seeds and other technologies such as mechanization and irrigation.

The presenter projected that nearly 90% of cotton production from sub Saharan Africa will be exported by 2029 accounting for 18% of global cotton exports by 2029, driven by favorable cotton prices. It is therefore imperative that the continent adopts modern technological solutions such as biotechnology. Crop losses in the continent due to insect pests are estimated at 49% of the expected yields each year. The legume pod borer is reported to cause yields of up to 80% and has been reported in Nigeria, Niger and Burkina Faso. The cotton bollworm causes up to 90% damage if left unaddressed.

From the Indian experience, Bt. cotton introduced in 2002 has positively impacted the cotton sector. The country is now one of the largest cotton producers in the world having moved from a net importer to net exporter of cotton. In addition, the country has seen a reduction of chemical pesticide use for bollworm control. With regard to opportunities for the private sector, Josh identified distribution of seed as an important role that the private sector may play, especially given that private sector has better access to farmers. In addition, the crops will need nutrition so the private sector can offer crop nutrition services. Stewardship and extension service are also an open opportunity for the private sector participation since most farmers will need guidance at various stages of production.

However, for the private sector to exploit the available opportunities, there is need to address the prevailing challenges that may stifle sustainable participation of the private sector. Some of the identified challenges include under-developed markets and distribution channels. Funding and support for the initial input access is needed to stimulate uptake. Streamlining of regulatory framework and harmonization of the same is also required to enhance efficiency and allow participation of the private sector.

Opportunities for International Trade in GMOs: The Case of US Soybean

Rosalind Leeck, Senior Director of Market Access at U.S Soybean Export Council (USSEC)



Rosalind gave an overview of soybean production and marketing in the US. Rosalind stated that in the U.S, soybean is grown on 30-36 million hectares out of which 97% are family owned. Participants heard that U.S soybean exports are valued at more than USD \$20 billion with 55-60% of U.S soy is exported annually as whole beans, meal or oil. The presenter noted that the European Union is the second largest importer of US soy, only second to China.

Going by such huge export value of what is largely if not 100% GMOs, it is evident that GMOs have a big market out there. This was further evidenced when the presenter indicated that Brazil is currently the largest producer of soy and has continued to increase its GM soya plantings because the technology is profitable. Rosalind however advised participants that to sustainably engage in soybean production, it is important to pursue economic viability and sustainable production. Compliance with national laws and rules as well as export standards is also paramount. As a moral obligation, today's production should also endeavor to leave a bequeath a good farming legacy to the next generation.

“With improved/GM varieties, scientific studies show reduced pesticide and fuel use, improved yields and soils, and higher profits for farmers growing them.”

Rosalind Leeck, Senior Director of Market Access at USSEC.



Private Sector Focus Group Discussion (FDG):

Opportunities for Biotech Enterprises in Africa

To get the perspectives of private sector players in the six countries, each country held a separate focus group discussion guided by four questions that were identical for all the countries. Each country had a different session chairperson drawn from the private sector. After deliberations on the each of the questions, each chairperson presented their responses as collectively summarized below.

Key challenges affecting biotechnology acceptance and how can they can be overcome

- **Informal cross border seed trade:** Cross border agro-business of Bt seeds can create administrative/regulatory challenges especially where one country has commercialized the crop while they trading neighbor is yet to officially commercialize the same variety. This may be mitigated by collaboration among stakeholders including immigration personnel from neighboring countries.
- **Knowledge gap:** There is a big challenge in understanding what biotech is in the country, how it works and how it is poised to benefit the common people. There should be appropriate communication to the public, on the benefits and all the mechanisms around the technology.
- **The high cost of the technology:** The farmers feel the tech (bollguard II) is too expensive. The solution is the domestication of seed production.
- **Insufficient teamwork:** Scientists across the continent sometimes tend not to look connected enough. To an extent, this alongside the lack of awareness encourages to the public the notion that biotech is a foreign concept that is being imposed upon us.
- **Lack of private sector involvement:** While the private sector plays a key role in the sector, it is largely not fully involved in the processes. The private sector therefore needs to be fully involved in the sector.
- **Absence of supportive Legal frameworks:** There lacks proper and sufficient legal frameworks in the country to address some of the issues that arise concerning biotechnology.
- **Politics and Government intrusions:** Sometimes politics of the country play a role in stifling the adoption of biotechnology in the country. Such may include the ban of GM products in the country, which has led to a shortage of important raw material such as those required for livestock feed production. A strong voice by the private sector is essential to push the Government to look into such issues.
- **Lack of commercialized technology:** Absence of a product in some countries denies private sector the opportunity to participate. Relevant stakeholders including policymakers and technology providers should establish pilot plots to expose the private stakeholders to the benefits of biotechnology

The role of the private sector in supporting the creation of an enabling environment for biotechnology in Kenya including streamlining the regulatory process

The private sector felt that they have a role to play in creating an enabling environment by for example, voicing unified call for appropriate policies such as advocating for lifting of the GM import ban to allow importation of raw materials for feed production. Secondly, the private sector may provide extension services that boost farmer understanding and adoption of the technology. The third role for private sector is to support development of right regulatory framework by funding advocacy processes in countries where there is need to create new laws or improve existence ones.

Opportunities that the private sector see in the emerging biotechnology sector

The private sector identified several potential opportunists in the biotechnology sector. Key among such opportunities include provision of crop insurance services, which the private players noted that though not currently active in most countries, it would be activated with increases in yields. The private sector also indicated their interest in the production and supply of seeds (e.g., Bt. cotton seed production and supply). The third opportunity on the groups mind was value addition in biotechnology products. Using Bt. Cotton as an example, the private may utilize cotton seed for making cotton seed oil and cotton seed cake. Still on value addition, the private sector may consider start ginneries to take advantage of the Bt Cotton. Transportation of farm inputs and resultant produce is yet another opportunity that investors in the private sector can partake.



Farmers Session



Reaping the Benefits of Biotech Crops: Perspectives from Farmers

The session brought together farmers that grow various biotech crops as well as those aspiring to adopt. To start of the session, there were two presentations, one by a cotton farmer based in India and the other from a soybean farmer in the US as follows:

Reaping the Benefits of Biotech Crops: Perspectives from **Indian Bt. Cotton Farmer**

Farmer, Tamil Nadu, India, and Member, Global Farmer Network



The African Farmers and other participants had the pleasure of hearing from V. Ravichandran, an Indian cotton farmer. Ravichandran shared the horror that Indian cotton farmers went through under the bollworm menace before Bt. cotton came to their rescue. Listing one by one, Ravichandran outlined the negative experience with the pests before Bt. Cotton.

In what looked like a chronology of farmer's transitional journey from conventional to Bt. cotton, the Indian farmer detailed how pests devastated the cotton crop thus reducing yields and inflicting huge economic losses. This necessitated spraying of different chemicals as well as biological control. With time, the pests appeared to develop resistance to the various chemicals used by farmers. The farmers then had to spray more quantities of chemicals that in turn drained the farmers' resources putting them in cycles of debts.

By the time Bt. cotton was commercialized, most farmers were on the verge of giving up on cotton farming. At present 100% of India's cotton is Bt cotton. The chronology of India's transition from of events gave participants a clear picture of how pests can turn farmers' lives into a living nightmare.

Despite the terrible experience with pests and presence of biotech solution in the form of Bt. cotton, the presenter recalled how it took him more than two years battling skepticism about safety and efficacy of the Bt. technology. According to Ravichandran, he delayed adopting Bt. cotton for two years due to misinformation on cost of seed and scary myths about risks to livestock and earth worms. However, after adopting the technology, the farmer has registered the following benefits:

- **Increase in yield per acre:** this has been due to absence of boll shedding given the absence of bollworms and unhindered growth and vigor of the plant right from when it is sowed.
- **Low costs of production:** the reduction in quantities of chemicals purchased and saving on spraying labor have both lowered the costs of production.
- **Higher prices:** the farmer noted that he has registered an increase in per unit selling price of the products due to better quality of cotton that is free from insect damage

Reaping the Benefits of Biotech Crops: Perspectives from **US Soybean Farmer**

Doug Winter, Vice Chairman, U.S Soy Bean Export Council, Mill
Shoals, Illinois



Doug Winter provided the African farmers and other participants with an opportunity to hear the soybean farming story from the US. In his experience sharing, Doug Winter concentrated on the benefits of modern biotechnology, noting that genetically modified soybean production in the US continues to have significant positive impacts in other ways beyond enhanced yields.

In terms of sustainability, the technology improves soil and weed control, increases use of no-till and direct drilling into crop stubble. In addition, the crop residue creates a mulch layer for the earthworm populations and soil microbes that in turn improves soil structure. It also reduces pesticide use. The farmer further lauded the potential of biotechnology, indicating that the technology could be used to grow climate change response crops such as those tolerant to drought as well as crops with enhanced nutritional value.



Focus Group Discussion (FGD):

The last focus group discussion aimed at getting farmers perspectives on matters of biotechnology in each of the six countries. To achieve this, six farmer-led FGDs were concurrently held in the six countries after which the country session leaders shared country level deliberations with the rest of the participants. To guide the discussion, four questions were posed and harmonized responses from all the six countries documented under the following subtopics:

Opportunities for farmers to influence decision-making on biotechnology and access to biotech crops

Supportive government: Farmers were of the opinion that governments are currently supportive of biotechnology. Farmers and farmer organizations can therefore raise their voices for the government to allow and support growing of biotech crops to enable farmers enjoy the benefits and yields that these crops give.

Community media houses: There are community media (such as radio) that can be used for communicating biotech interventions to farmers in the rural farming communities.

Uptake of biotechnology: farmers in countries where one or more biotechnology crops have been commercialized should take lead in adopting. This will not only influence other farmers to also join but will make decision makers know that indeed farmers need the technology.

What concerns are being raised about biotechnology by your communities in the country?

Farmers were asked to give their local level perspectives of the public concerns that may need to be addressed especially with regard to perceptions. Some of the concerns recorded among farming communities and their neighbours include issues of safety. Some farmers reported that their neighbours still have concerns that biotechnology crops may cause cancer. The issue of GM seeds being planted only once also persists among farmers in several countries. The high costs of seed is also a concern among farmers since it may constrain access to the various biotechnology applications. In addition, there is misconception that hybrid varieties will require intensive use of fertilizers, which are too expensive for the ordinary farmer. To address the concerns, farmers proposed the following interventions:

- **Farmer training:** there should be programs of training of farmers trainer to enable lead farmers to train their fellow farmers in matters of biotechnology.
- **Demonstration plots:** stakeholders should establish demonstration farms in the rural farming communities so that farmers can experience firsthand the benefits of biotech crop varieties.
- **Production of seed in the African countries:** Technology providers should to set their subsidiaries in the countries that require the Bt. seed in order to provides easy access by the farmers as well as job opportunities.
- **Address misinformation:** Communication strategies should put in place to help disseminate accurate information to the public

Most effective strategies for sustaining biotech progress

From the group discussions, farmers came up with several strategies to sustain biotech progress. It was suggested that farmer organizations should arrange for meetings with authorities such as the Ministry of agriculture and air their concerns so that they can be addressed. The second suggestion was the need to form community outreach groups that will facilitate adoption and integration of biotech crops especially among smallholder rural communities. Thirdly, market development to assure farmers of where to sell will give confidence to farmers hence sustain biotech development. It is also important for all stakeholders to hasten decision-making process to avail biotech crops especially in countries where none has been commercialized so far.

DAY FIVE

INTRODUCTION

Day five focused on the global and Africa's policy and regulatory perspectives on Genome Editing. It marked the end of the symposium and with it came one plenary presentation, the launch of the African Coalition for Communicating about Genome Editing and the closing ceremony that was officiated by Hon. Betty Maina, the Cabinet Secretary Ministry of Industrialization, Trade and Enterprise Development for Kenya.

PLENARY PRESENTATION

Global and Africa policy and regulatory perspectives of genome editing



John Komen from the Program for Biosafety Systems (PBS) started by differentiating genome editing from genetic modification as applied in scientific circles and in relation to the definition of GMO contained in the Cartagena Protocol. Noting that gene editing is a newly emerging technology in the field of research, John clarified that unlike genetic modification (GM), some genome edited (GE) products has no transgenes involved in it. The resultant organism consequently contains no novel combination of genetic materials.

According to the Cartagena protocol, genome edited products would be regarded as different from GMOs. Despite such difference, John regretted that the EU is so far treating genome-edited products as GMOs. According to the current EU position, GMOs is an organism whose genetic material has been altered in ways that do not occur naturally; and this include genome editing, as much as it is not in line with the Cartagena Protocol's definition of GMO.

Komen also brought a second perspective, that from Argentina, which significantly contrasts EU position. From John's presentation, it was learnt that Argentina restricts the definition of GMOs to the provisions of the Cartagena protocol, maintaining that the question to be asked is whether or not the resultant product contains novel combination of genetic materials. To this end, Argentina handles each genome-edited organisms on case by case. In case the product has novel combination of genetic materials, it is treated as GMO and subjected to GMO regulation; but if it lacks novel combination of genetic materials, it is treated as conventional and only subjected to the safety assessments relevant to conventional products. With such more permissive approach, Argentina has been able to play a very active role in genome editing projects.

In view of the potential of genome editing in addressing global challenges, Africa was encouraged to adopt regulatory systems that allow the continent to exploit and benefit from genome editing, a technology that is more versatile than genetic modification. To address the limitations in regulatory framework, the presenter noted that the current systems can handle genome editing. In this regard, John lauded the steps taken by Nigeria to expand biosafety law to accommodate genome editing. John further highlighted other African countries such as Kenya that are taking similar steps to actively engage in genome editing activities. This is particular important if African is to effectively address her challenges, including feeding the growing population that is expected to reach 2.2 billion people by the year 2050. In a nutshell, African countries may consider the case by case regulatory approach that has been embraced by Argentina and Nigeria.

Mr Komen observed that genome editing could be equated to mutagenesis, which has been used for over 50 years without any safety concern. He noted that so far, there has not been any known safety concern emanating from genome editing applications. He further reminded the delegates that other than biotechnology regulations, each country retains and applies other safety measures.

THE LAUNCH OF AFRICAN COALITION FOR COMMUNICATING ABOUT GENOME EDITING



Positioning Africa for an Early Take-Off: The African Coalition for Communicating about Genome Editing

Under the coordination of ISAAA AfriCenter at the close of ABBC 2021, the African scientific community witnessed yet another important milestone in launching of the African Coalition for Communicating about Genome Editing. Guided by the philosophy of “Positioning Africa for an Early Take-Off”, the coalition responds to the fact that the voice of African scientists has for long been very low and almost unnoticed by the world outside the walls of their laboratories. According Dr. Karembu, “there had to be ways in which the efforts of the continent’s scientists could be made to be heard by the entire global community”.

In her remarks during the launch, Dr Karembu shared with participants that communication of modern technologies developed by African scientists had continually faced challenges and therefore required to be reinforced to keep pace with the rapid advancements. Recalling from the previous ABBC event, Dr Karembu pointed out that one of the clarion calls during ABBC 2019 was how Africa could be positioned as a continent, for early take-off for Genome Editing with one of the key recommendations being to come up with the African Coalition for Communicating about Genome Editing.

It is expected that the coalition will create a well-informed and knowledgeable society capable of making decisions and choices on responsible use of genome editing and its products.

To enhance its effectiveness, the African Coalition for Communicating about Genome Editing will be premised on the following pillars:

- It will be hosted by universities and under the Africa Life Sciences Knowledge Hub, that is spearheading the Africa Science Dialogue series.
- It will consolidate ongoing projects using genome editing tools to ensure synergies in communication approaches
- It necessitates formation of country chapters which identify flagship products likely to attract government support
- It will conduct a KAP survey to facilitate a data-driven engagement strategy
- It will be inclusive and thus liaise with other, thus liaises with other regional initiatives e.g., Network of African Science Academies (NASAC), African Biosafety Network of Expertise (ABNE), and local and global private sector players etc. for building political goodwill and investments.

Introduction of the Coalition partners and partner institutions

Dr Karembu gave chance to the various partners who have contributed and/or will be hosting the various chapters of the coalition. Each partner was given about five minutes to make remarks. To go first was Elder Prof. Chigozi Ogbu, Vice-Chancellor of Ebonyi State University in Nigeria who observed that Africa has previously been waiting to “follow” on biotech but this should change and become leaders but this will need appropriate communication. Second was Prof. Daniel Mugendi, Vice-Chancellor of University of Embu who emphasized that scientists should go beyond publishing papers and engage stakeholders to boost uptake of technologies such as genome editing which is a welcome tool in the breeders’ toolbox-will. In this regard, Prof. Mugendi assured the coalition that the University of Embu would provide any needed support within its powers. Third was the Vice-Chancellor - Masinde Muliro University of Science and Technology Prof Shibairo, who expressed optimism that unlike in the past when people had to wait for accidental mutation to take advantage, currently there are technologies such as genome editing that can help researchers deliver better products within a relatively short time.

On his part, Prof Geoffrey Munuvi, Vice-Chancellor of South Eastern Kenya University noted that Africa stands to benefit from genome editing by way of pest and disease control, reduced breeding climate, breeding of smart crops as well as coming up with nutritionally enhanced crops. Ethiopia’s Addis Ababa University Vice President for Research and Technology Transfer sent goodwill message and committed to supporting the Coalition. Also giving remarks was Dr Dianah Ngonyama, ISAAA board member and Associate Director for research administration and research integrity, Iowa State University. Diana encouraged participants to both embrace genome editing and genetic engineering without so much preference of one over the other. Non-university-based speakers included Betty Kiplagat of Corteva, Dr. Silas Obukosia of ABNE and Patricia Nanteza of Corneli Alliance for Science. In addition to the Nigeria and Kenya, Ethiopia is also participating in hosting the coalition chapter.

In summary, all the speakers embraced the idea of the coalition and promised to support and work with other coalition members.



A group photo taken during the launch of the Africa Coalition on Communicating about Genome Editing

CLOSING REMARKS



The Role of Innovations in Expanding Trade and Competitiveness of Africa's Agricultural Commodities: The Case of Cotton sub-sector.

Hon. Betty Maina, Cabinet Secretary Ministry of Industrialization, Trade and Enterprise Development

The symposium was officially closed by Hon. Betty Maina Cabinet Secretary Ministry of Industrialization, Trade and Enterprise Development who highlighted the role of innovations in expanding trade and competitiveness. In particular, Hon. Maina pointed out the importance of cotton in the manufacturing sector and the downstream benefits including employment creation.

Talking about the strength of cotton, Hon. Maina detailed the various markets available for Africa cotton such as the African Growth Opportunity Act (AGOA), for which Africa is only meeting a paltry two percent of its quota. Despite the importance and potential of cotton, the crop has suffered many challenges including damage from pests such as cotton bollworm. The Cabinet Secretary noted that such challenges have send cotton sector on a down ward trajectory, denying African Income and employment opportunities.

As way forward, Hon. Maina observed that today, science, technology and innovation afford us a myriad of solutions to the numerous challenges that the agricultural sector and its inherent subsectors continue to face. Substantiating her observation, the guest noted how early adopters of Bt. cotton such as India, China, U.S, Pakistan and Brazil have developed thriving textile industries and export their cotton fabric to other global markets including Africa. Joint deliberate and targeted interventions, Africa can make use of the existing innovations to ensure that cotton retains its deserved glory as an important source of raw materials for industrial development. To aid the process, scientists were urged to come out and communicate effectively in order to shape policy decisions and consumer choices.



I believe that what we need to do is to develop the capacity and capabilities of our countries and their scientists and research institutions, for more research and development in the different biotech disciplines. This will ensure that we continue to harness the benefits that this novel technology presents.

CS Betty Maina, Kenyan Cabinet Secretary for Enterprise Industrialization and Trade Development



Biotech Crops in Kenya Mini-Documentary

During the closing session, a mini-documentary on Kenya's experiences with biotech crops was screened. The video captures voices and views of key stakeholders that have been involved in the journey to commercialization. Two key milestones were the 2019 milestone when the Kenyan Cabinet chaired by the President approved commercialization of Bt cotton. Further, 2021 National Biosafety Authority approval of GM cassava for National Performance Trials, the first country in the world to do so, was heralded as another milestone where key lessons shared could inspire countries aspiring to commercialize GM crops.



Screengrab of the Kenya biotech crops mini-documentary

The background of the page is a light gray geometric pattern consisting of interlocking zig-zag and chevron shapes. A teal-colored rounded rectangle is centered on the page, containing the chapter title. At the bottom of the page, there is a decorative border with a teal background and a repeating pattern of white and yellow diamonds.

CHAPTER THREE:

CONCLUSION AND RECOMMENDATIONS

Conclusion

The approach employed by ABBC 2021 proved successful as the symposium achieved, if not surpassed its objectives.

- The first objective of the symposium was “to share experiences on agricultural biotechnology/ biosafety and inspire upcoming countries”. As seen from the various presentations and discussions, participants shared experiences on various aspects of biotechnology and biosafety including discussions with Scientists, regulators, communicators and farmers from Africa, India and the United States. Participants were able to share on challenges, opportunities and best way forward.
- The symposium had also sought “to synthesize the best communication and policy advocacy strategies for accelerating the region’s momentum”. On this front, various communication expert’s converged to identify what has worked and what need to be improved. In addition, various stakeholders gave their perspectives on how communication could be improved, noting the current weaknesses and opportunities for improvement.
- Objective three was “to take stock of and amplify the successes made over the years and celebrate notable contributions from African scientists”. The symposium indeed availed a forum for sharing on what various countries are doing. The participants heard that Nigeria had so far commercialized two crops and had expanded her Biosafety Law of 2015 to accommodate genome editing. Malawi, Kenya and Ethiopia have also commercialized Bt. cotton while Uganda and Ghana are on the verge commercialization. Out of these commendable efforts, ABBC indeed recognized six outstanding African scientists in a ceremony held on the third day of the symposium.
- The final objective of ABBC 2021 was “to launch the African Coalition on Communicating about Genome Editing, a key recommendation from ABBC 2019”. Under the leadership of Dr. Margaret Karembu, the coalition was launched with all participating universities and partners represented.

Recommendations

The various categories of stakeholders deliberated on their effective contribution to biotechnology development in African and came up with the following recommendations

Policy Makers

1. Policy makers should be involved and engaged right from project inception
2. Scientist should come out to talk about the benefits of the technology and to also address the concerns raised by the public to enhance political will
3. The government and other regional bodies should fund biotech research and product development.

Science Journalists and communicators

1. Researchers should simply language and consider using local media including translation to vernacular languages, and develop a gallery from which both the mainstream and community media can access appropriate pictures.
2. Create a benefits narrative and repeat it consistently without allowing for a vacuum
3. Train journalists, Sub-editors and editors in biotechnology to avoid being misreported

Scientists/researchers

1. Enhance skills in communication
2. Pursue multi-disciplinary collaborations and avoid silo mentality
3. Mentor and uplift the next generation of scientists

Regulators

1. Regulators should collaborate and harmonize regulations
2. Decision makers to consider genome editing as an important tool and allow for case by case risk assessment based on product rather than process
3. Scientists/researchers/technology developers should engage regulators from the start to end of the project

Private Sector Players

1. Scientists should involve private sector players early in the products' development processes and clearly outline how the private sector could make business out of the biotech product being developed.
2. Policies and regulations should be streamlined to allow efficient participation of the private sector
3. Private sector players should engage policy makers to push for facilitative biotechnology policies

Farmers

1. Create demonstration plots to enable farmers experience the technology in the field. This way, the farmers can be trained, and they, in turn train their fellow farmers on matters biotechnology.
2. Farmers should voice their need for biotechnology to the policy makers, while the biotech stakeholders address the concerns raised by the public on the technology. This ensures synergy in driving the biotech agenda.
3. Relevant stakeholders in the sector, such as seed producers, should strive to ensure that there is seed production within the countries of interest to make the commodity affordable and accessible in a timely manner.

More recommendations

1. African universities should provide a knowledge hub that facilitates knowledge transfer and understanding of crop biotechnology and new breeding technologies such as genome editing.
2. There should enhanced inter-university collaborations and synergized efforts in bolstering understanding about biotechnology and addressing misinformation thereof.

CHAPTER FOUR: **ANNEXES**

Symposium Program

Day One:

Monday 20th September, 2021

Opening Ceremony

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
11:00 – 11:30 EAT 10:00 - 10:30 Malawi Time 09:00 - 09:30 Nigeria Time 08:00 - 08:30 Ghana Time	Registration/ Meet and Greet for In-person Participants		ALL participants (virtual participants to register via a google doc)
11:30 - 12:10 EAT 10:30 - 11:10 Malawi Time 09:30 - 10:10 Nigeria Time 08:30 - 09:10 Ghana Time	Official Opening	Official Opening Remarks	<ul style="list-style-type: none"> • Dr. Margaret Karembu, ISAAA AfriCenter Director and Co-Convener ABBC 2021 • Prof. Aggrey Ambali, Head of Science, Technology and Innovation Hub, AUDA-NEPAD Agency • Dr. Maha Arujanan, ISAAA Global Coordinator • Dr. Canisius K. Kanangire, AATF Executive Director • Chavonda Jacobs-Young, Administrator of USDA's Chief Scientific In-House Research agency
12:10 – 12:20 EAT 11:10 - 11:20 Malawi Time 10:10 - 10:20 Nigeria Time 09:10 - 09:20 Ghana Time	Screening of Nigeria mini-documentary	Focus on Maruca Resistant (Bt) Cowpea	ALL
12:20 – 12:50 EAT 11:20 - 11:50 Malawi Time 10:20 - 10:50 Nigeria Time 09:30 - 09:50 Ghana Time	Keynote Address	Past, Present and Future Prospects of Biotechnology in Africa	Prof. Jennifer Thomson, Emeritus Professor in the Department of Molecular and Cell Biology at the University of Cape Town
12:50 – 13:20 EAT 11:50 - 12:20 Malawi Time 10:50 - 11:20 Nigeria Time 09:50 - 10:20 Ghana Time	Discussion	Past, Present and Future Prospects of Biotechnology in Africa	Moderated by overall and in-country facilitators
13:20 – 14:20 EAT 12:20 - 13:20 Malawi Time 11:20 - 12:20 Nigeria Time 10:20 - 11:20 Ghana Time	Lunch break for EAT Zone Participants Refreshment Break for WAT Zone Participants Group Photo		ALL

14:20 – 14:40 EAT 13:20 – 13:40 Malawi Time 12:20 – 12:40 Nigeria Time 11:20 – 11:40 Ghana Time	Keynote Address	The Policies and Practice of Genetically Modified Foods in the European Union: Impacts on Africa	Priscila Quaini Jacobitz, Government Affairs Manager, CropLife Europe
14:40 – 15:00 EAT 13:40 – 14:00 Malawi Time 12:40 – 13:00 Nigeria Time 11:40 – 12:00 Ghana Time	Discussion		ALL
15:00 – 16:00 EAT 14:00 – 15:00 Malawi Time 13:00 – 14:00 Nigeria Time 12:00 – 13:00 Ghana Time	Policy dialogue	The Africa we Want: Role of Biotechnology in Socio-Economic Transformation	<p>Policy/decision makers from Ethiopia, Kenya, Malawi, Ghana, Nigeria and Uganda</p> <p>Dr. Solomon Belay, Advisor to the Minister of Innovation and Technology, Ethiopia</p> <p>Dr. Felister Makini, Deputy Director General, Kenya Agricultural and Livestock Research Organization, Kenya</p> <p>Prof. Elijah Wanda, Director General, National Commission for Science and Technology, Malawi</p> <p>Dr. Fidelis Ocloo, Deputy Director, Biotechnology and Nuclear Agriculture Research Institute (BNARI), Ghana</p> <p>Prof. Abdullahi Mustapha, Director General, National Biotechnology Development Agency, Nigeria</p> <p>Dr. Yona Baguma, Deputy Director General-Research at the National Agricultural Research Organisation, Uganda</p> <p>Moderator: - Dr. Jeremy Ouedrago, Director, AUDA-Africa Biosafety Network of Expertise</p>

16:00 – 16:40 EAT 15:00 - 15:40 Malawi Time 14:00 - 14:40 Nigeria Time 13:00 - 13:40 Ghana Time	Discussion	The Africa we Want: Role of Biotechnology in Socio-Economic Transformation	Moderated by overall and in-country facilitators
16:40 – 16:50 EAT 15:40 - 15:50 Malawi Time 14:40 - 14:50 Nigeria Time 13:40 - 13:50 Ghana Time	Screening of Malawi Mini-documentary	Focus on Insect Resistant (Bt) cotton	ALL
16:50 – 17:00 EAT 15:50 - 16:00 Malawi Time 14:50 - 15:00 Nigeria Time 13:50 - 14:00 Ghana Time	Closing Remarks and Updates for Subsequent Days		Bibiana Iraki, Program Officer, ISAAA AfriCenter
17:00 EAT 16:00 Malawi Time 15:00 Nigeria Time 14:00 Ghana Time	End of Opening Ceremony/ Refreshments for EAT Participants and Lunch for WAT Participants		ALL

Day Two:

Tuesday 21st September, 2021

Focus group session one - Policy makers

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
11:00 – 11:10 EAT 10:00 - 10:10 Malawi Time 09:00 - 09:10 Nigeria Time 08:00 - 08:10 Ghana Time	Plenary Presentation: Policy makers' session	The Politics of Genetically Modified Foods: An African Perspective	Hon. Dr. Elioda Tumwesigye Former Minister, Science, Technology and Innovation, Uganda
11:10 – 11:30 EAT 10:10 - 10:30 Malawi Time 09:10 - 09:30 Nigeria Time 08:10 - 08:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
11:30 – 12:30 EAT 10:30 - 11:30 Malawi Time 09:30 - 10:30 Nigeria Time 08:30 - 09:30 Ghana Time	Focus Group Discussion (FGD): Policy Makers	Enabling Policies and Actions for Supporting Africa's Biotechnology Development	ALL - Facilitated by in-country chairs
12:30 – 13:30 EAT 11:30 - 12:30 Malawi Time 10:30 - 11:30 Nigeria Time 09:30 - 10:30 Ghana Time	Report back from FGD: Policy Makers		Moderated by overall and in-country facilitators - Ten minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
13:30 EAT 12:30 Malawi Time 11:30 Nigeria Time 10:30 Ghana Time	Lunch for EAT Participants / Refreshments for WAT Participants and Group Photo		ALL

Focus group session two – Journalists and Science Communicators

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
14:30 – 14:50 EAT 13:30 - 13:50 Malawi Time 12:30 - 12:50 Nigeria Time 11:30 - 11:50 Ghana Time	Plenary Presentation: Journalists and Science Communicators' Session	Balancing Science Stories: The Challenge of False Balance Effective Biotech and Biosafety Communications: Lessons from the Open Forum on Agricultural Biotechnology (OFAB) in Africa	Diran Onifade, Editor-in-Chief, AfricaSTI, Former Vice President, World Federation of Science Journalists (10 minutes) Vitumbiko Chinoko, Project Manager, OFAB (10 minutes)
14:50 – 15:30 EAT 13:50 - 14:30 Malawi Time 12:50 - 13:30 Nigeria Time 11:50 - 12:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
15:30 – 16:30 EAT 14:30 - 15:30 Malawi Time 13:30 - 14:30 Nigeria Time 12:30 - 13:30 Ghana Time	Focus Group Discussion: Journalists and Science Communicators	Collaborating Towards an Informed Citizenry through Effective Biotech and Biosafety Communications	ALL - Facilitated by in-country chairs
16:30 – 17:00 EAT 15:30 - 16:00 Malawi Time 14:30 - 15:00 Nigeria Time 13:00 - 14:00 Ghana Time	Report back from FGD		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
17:00 EAT 16:00 Malawi Time 15:00 Nigeria Time 14:00 Ghana Time	End of Day Two/ Refreshments for EAT Participants and Lunch for WAT Participants/Group Photo		ALL

Day Three:

Wednesday 22nd September, 2021

Focus group session three – Regulators

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
11:00 – 11:10 EAT 10:00 - 10:10 Malawi Time 09:00 - 09:10 Nigeria Time 08:00 - 08:10 Ghana Time	Plenary presentation: Regulators' session	Effective Coordination of Biosafety Regulations in Africa: Insights from Kenya's Inaugural Biosafety Chief Executive	Dr. Willy Tonui, Head of Secretariat, The Africa Genetic Biocontrol Consortium and Inaugural CEO (2012 – 2018), Kenya National Biosafety Authority
11:10 – 11:30 EAT 10:10 - 10:30 Malawi Time 09:10 - 09:30 Nigeria Time 08:10 - 08:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
11:30 – 12:30 EAT 10:30 - 11:30 Malawi Time 09:30 - 10:30 Nigeria Time 08:30 - 09:30 Ghana Time	Focus Group Discussion (FGD): Regulators	Effective Coordination of Biosafety Regulations at the National and Regional Level	ALL - Facilitated by Biosafety CEO's
12:30 – 13:00 EAT 11:30 - 12:00 Malawi Time 10:30 - 11:00 Nigeria Time 09:30 - 10:00 Ghana Time	Report back from FGD: Regulators		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
13:00 – 13:10 EAT 12:00 - 12:10 Malawi Time 11:00 - 11:10 Nigeria Time 10:00 - 10:10 Ghana Time	Plenary Presentation: Regulators' session	Case Study: Coordination of Biosafety Regulatory System – Experiences from a Technology Developer	Godwin Lemgo, Regulatory Scientific Affairs Manager – Africa, Bayer Crop Science
13:10 – 13:30 EAT 12:10 - 12:30 Malawi Time 11:10 - 11:30 Nigeria Time 10:10 - 10:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
13:30 EAT 12:30 Malawi Time 11:30 Nigeria Time 10:30 Ghana Time	Lunch for EAT Participants / Refreshments for WAT Participants and Group Photo		ALL

Focus group session four – Scientists/Researchers

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
14:30 – 14:50 EAT 13:30 – 13:50 Malawi Time 12:30 – 12:50 Nigeria Time 11:30 – 11:50 Ghana Time	Plenary presentation: Scientists/Researchers' session	Delivering Africa's First Biotech Food Crops: Lessons from Bt Cowpea and Disease-Resistant Cassava	Prof. Mohammad Ishiyaku, Bt Cowpea Lead Scientist, Nigeria (10 minutes) Prof. Douglas Miano, VIRCA Plus Kenya Lead Scientist (10 minutes)
14:50 – 15:00 EAT 13:50 – 14:50 Malawi Time 12:50 – 13:50 Nigeria Time 11:50 – 12:00 Ghana Time	Plenary presentation: Scientists/Researchers' session	Opportunities for strengthening global agri-biotech research collaboration	Dr. Marc Heijde, Program Manager of the International Plant Biotechnology Outreach Division (IPBO) at the Flemish Institute of Biotechnology (VIB)
15:00 – 15:45 EAT 14:00 – 14:45 Malawi Time 13:00 – 13:45 Nigeria Time 12:00 – 12:45 Ghana Time	Discussion		Moderated by overall and in-country facilitators
15:45 – 16:45 EAT 14:45 – 15:45 Malawi Time 13:45 – 14:45 Nigeria Time 12:45 – 13:45 Ghana Time	Focus Group Discussion: Scientists/Researchers		ALL - Facilitated by in-country chairs
16:45 – 17:15 EAT 15:45 – 16:15 Malawi Time 14:45 – 15:15 Nigeria Time 13:45 – 14:15 Ghana Time	Report back from FGD		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
17:15 – 17:45 EAT 16:15 – 16:45 Malawi Time 15:15 – 15:45 Nigeria Time 14:15 – 14:45 Ghana Time	Recognising Scientists/ Researchers in the Six Focus Countries		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
17:45 EAT 16:45 Malawi Time 15:45 Nigeria Time 14:45 Ghana Time	End of Day Two/ Refreshments for EAT Participants and Lunch for WAT Participants/ Group Photo		ALL

Day Four:

Thursday 23rd September, 2021

Focus group session five – Private sector

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
11:00 – 11:10 EAT 10:00 - 10:10 Malawi Time 09:00 - 09:10 Nigeria Time 08:00 - 08:10 Ghana Time	Plenary Presentation: Private Sector's Session	Opportunities for Biotech Enterprises in Africa	Joshi Kaustubh, Cotton Business Lead, Maharashtra Hybrid Seeds Company Limited (Mahyco)
11:10– 11:30 EAT 10:10 - 10:30 Malawi Time 09:10 - 09:30 Nigeria Time 08:10 - 08:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
11:30 – 12:30 EAT 10:30 - 11:30 Malawi Time 09:30 - 10:30 Nigeria Time 08:30 - 09:30 Ghana Time	Focus Group Discussion (FGD): Private Sector	Opportunities for Biotech Enterprises in Africa	ALL - Facilitated by in-country chairs
12:30 – 13:00 EAT 11:30 - 12:00 Malawi Time 10:30 - 11:00 Nigeria Time 09:30 - 10:00 Ghana Time	Report back from FGD: Private Sector		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
13:00 – 13:10 EAT 12:00 - 12:10 Malawi Time 11:00 - 11:10 Nigeria Time 10:00 - 10:10 Ghana Time	Plenary Presentation: Private Sector's Session	Opportunities for International Trade in GMOs: The Case of US Soybean	Rosalind Leeck, Senior Director of Market Access at U.S Soybean Export Council
13:10 – 13:30 EAT 12:10 - 12:30 Malawi Time 11:10 - 11:30 Nigeria Time 10:10 - 10:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
13:30 EAT 12:30 Malawi Time 11:30 Nigeria Time 10:30 Ghana Time	Lunch for EAT Participants / Refreshments for WAT Participants and Group Photo		ALL

Focus group session six – Farmers

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
14:30 – 14:40 EAT 13:30 - 13:40 Malawi Time 12:30 - 12:40 Nigeria Time 11:30 - 11:40 Ghana Time	Plenary Presentation: Farmers' Session	Reaping the Benefits of Biotech Crops: Perspectives from Farmers	V. Ravichandran, Farmer, Tamil Nadu, India, Member Global Farmer Network
14:40 – 15:00 EAT 13:40 - 14:00 Malawi Time 12:40 - 13:00 Nigeria Time 11:40 - 12:00 Ghana Time	Discussion		Moderated by overall and in-country facilitators
15:00 – 15:10 EAT 14:00 - 14:10 Malawi Time 13:00 - 13:10 Nigeria Time 12:00 - 12:10 Ghana Time	Plenary Presentation: Farmers' Session	Reaping the Benefits of Biotech Crops: Perspectives from Farmers	Doug Winter, Vice Chairman, U.S Soy Bean Export Council, Mill Shoals, Illinois
15:10 – 15:30 EAT 14:10 - 14:30 Malawi Time 13:10 - 13:30 Nigeria Time 12:10 - 12:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
15:30 – 16:30 EAT 14:30 - 15:30 Malawi Time 13:30 - 14:30 Nigeria Time 12:30 - 13:30 Ghana Time	Focus Group Discussion: Farmers		ALL - Facilitated by in-country chairs
16:30 – 17:00 EAT 15:30 - 16:00 Malawi Time 14:30 - 15:00 Nigeria Time 13:00 - 14:00 Ghana Time	Report back from FGD		Moderated by overall and in-country facilitators - Five minutes per country (Ethiopia, Ghana, Kenya, Malawi, Nigeria and Uganda)
17:00 EAT 16:00 Malawi Time 15:00 Nigeria Time 14:00 Ghana Time	End of Day Four/ Refreshments for EAT Participants and Lunch for WAT Participants/ Group Photo		ALL

Day Five:

Friday 24th September, 2021

Genome Editing Session

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
11:00 – 11:30 EAT 10:00 - 10:30 Malawi Time 09:00 - 09:30 Nigeria Time 08:00 - 08:30 Ghana Time	Registration		ALL
11:30 – 12:00 EAT 10:30 - 11:00 Malawi Time 09:30 - 10:00 Nigeria Time 08:30 - 09:00 Ghana Time	Plenary Presentation: Genome Editing Session	Global and Africa Policy and Regulatory Perspectives of Genome Editing	John Komen, Africa Coordinator, Program for Biosafety Systems (15 minutes) Dr. Rufus Ebegba, Director-General/CEO, National Biosafety Management Agency, Nigeria and Chair, Africa Biosafety Regulators Forum (15 minutes)
12:00 – 12:30 EAT 11:00 - 11:30 Malawi Time 10:00 - 10:30 Nigeria Time 09:00 - 09:30 Ghana Time	Discussion		Moderated by overall and in-country facilitators
12:30 – 13:00 EAT 11.30 - 12.00 Malawi Time 10.30 - 11.00 Nigeria Time 09.30 - 10.00 Ghana Time	Launch of the African Coalition for Communication about Genome Editing	Positioning Africa for an Early Take-Off: The African Coalition for Communicating about Genome Editing	Dr. Margaret Karembu, Director, ISAAA AfriCenter and ABBC 2021 Co-convenor
13:00 – 13:45 EAT 12:00 - 12:45 Malawi Time 11:00 - 11:45 Nigeria Time 10:00 - 10:45 Ghana Time	Discussion and Highlights on Partners' Genome Editing Initiatives		3 minutes update by select partners
13:45 – 14:45 EAT 12:45 - 13:45 Malawi Time 11:45 - 12:45 Nigeria Time 10:45 - 11:45 Ghana Time	Lunch for EAT Participants and Refreshments for WAT Participants		

Closing Ceremony

Time (Shown in EAT, Malawi Time, Nigeria Time & Ghana Time) *EAT - Kenya, Uganda and Ethiopia	Session	Topic	Speaker
15:00 – 15:30 EAT 14:00 – 14:30 Malawi Time 13:00 – 13:30 Nigeria Time 12:00 – 12:30 Ghana Time	Plenary Presentation: Synthesis of ABBC 2021 Deliberations	Accelerating the Biotech Tipping Point: A Synthesis of ABBC 2021 Deliberations	Overall Rapporteur
15:30 – 16:15 EAT 14:30 – 15:15 Malawi Time 13:30 – 14:15 Nigeria Time 12:30 – 13:15 Ghana Time	Discussions and Way Forward		Moderated by overall and in-country facilitators
16:20 – 16:30 EAT 15:20 – 15:30 Malawi Time 14:20 – 14:30 Nigeria Time 13:20 – 13:30 Ghana Time	Screening of Kenya's Mini-Documentary	Focus on Insect Resistant (Bt) Cotton Value Chain	ALL
16:30 – 16:45 EAT 15:30 – 15:45 Malawi Time 14:30 – 14:45 Nigeria Time 13:30 – 13:45 Ghana Time	Closing Remarks	The Role of Innovations in Expanding Trade and Competitiveness of Africa's Agricultural Commodities: The Case of Cotton sub-sector.	Hon. Betty Maina, Cabinet Secretary Ministry of Industrialization, Trade and Enterprise Development
16:45 – 17:45 EAT 15:45 – 16:45 Malawi Time 14:45 – 15:45 Nigeria Time 13:45 – 14:45 Ghana Time	End of Symposium/ Refreshments for EAT Participants and Lunch for WAT Participants/ Group Photo	N/A	ALL

List of Speakers



Prof. Aggrey Ambali

Head of Science, Technology and Innovation Hub, AUDA-NEPAD Agency



Diran Onifade

Editor-in-Chief, AfricaSTI, Former Vice President, World Federation of Science Journalists



Hon. Betty Maina

Cabinet Secretary, Ministry of Industrialization, Trade and Enterprise Development, Kenya



Doug Winter

Vice Chairman, U.S Soy Bean Export Council, Mill Shoals, Illinois



Dr. Canisius K. Kanangire

Executive Director, African Agricultural Technology Foundation (AATF)



Prof. Douglas Miano

Lead Scientist, VIRCA Plus, Kenya



Chavonda Jacobs-Young

Administrator, Agricultural Research Service, U.S. Department of Agriculture (USDA)



Hon. Dr. Elioda Tumwesigye

Former Minister, Ministry of Science, Technology and Innovation, Uganda



Godwin Lemgo

Regulatory Scientific
Affairs Manager –
Africa, Bayer Crop
Science



**Joshi
Kaustubh**

Cotton Business
Lead, Maharashtra
Hybrid Seeds
Company Limited
(Mahyco)



**Prof. Jennifer
Thomson**

Emeritus Professor,
Department of
Molecular and Cell
Biology, University of
Cape Town



**Dr. Mahaletchumy
Arujanan**

Global Coordinator,
International Service for the
Acquisition of Agri-biotech
Applications (ISAAA)



**Dr. Jeremy
Ouedrago**

Director, AUDA-Africa
Biosafety Network of
Expertise



Dr. Marc Heijde,

Program Manager of
the International Plant
Biotechnology Outreach
Division (IPBO) at the
Flemish Institute of
Biotechnology (VIB)



John Komen

Africa Coordinator,
Program for
Biosafety Systems



**Prof.
Mohammad
Ishiyaku**

Lead Scientist,
Bt Cowpea, Nigeria



Priscila Quaini Jacobitz

Government Affairs
Manager, CropLife
Europe



V. Ravichandran

Farmer, Tamil Nadu, India,
Member Global Farmer
Network



Rosalind Leeck

Senior Director,
Market Access,
U.S Soybean Export
Council



**Vitumbiko
Chinoko**

Project Manager, Open
Forum on Agricultural
Biotechnology in Africa
(OFAB)



Dr. Rufus Ebegba

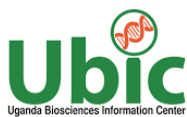
General/CEO, National
Biosafety Management
Agency, Nigeria and
Chair, Africa Biosafety
Regulators Forum



Dr. Willy Tonui

Head of Secretariat,
The Africa Genetic
Biocontrol Consortium
and Inaugural CEO
(2012 – 2018), Kenya
National Biosafety
Authority

Sponsors and Partners



Host and Moderators

HOST

Dr. Margaret Karembu

ISAAA AfriCenter Director and Co-Convener ABBC 2021

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Program Officer,

ISAAA AfriCenter

Waihiga Muturi

Founder and CEO,

Let's Create Africa

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Public and international Relations Director,

Ethiopian Biotechnology Institute, Ethiopia

Messay Emana Getu

Environmental Biotechnology Directorate,

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Dr. Stephen Mugo

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James Kasigwa

Director for ST&I Regulation and Biosafety, Ministry of Science, Technology and Innovation, Uganda

List of Rapporteurs

Kennedy Oyugi	Overall Rapporteur
Abigail Akoto	CR-Ghana
Benedict Odjobo	CR-Nigeria
Bibian Iraki	Overall Moderator
Birhanu Ayalew	CR-Ethiopia
Brian Okinda	CR-Kenya
Enoch Ilori	CR- Ghana
Evilla Badiru	CR- Nigeria
Getachew Melaku	CR-Ethiopia
Owen Singura	CR- Uganda
Walter Lang'at	CR- Kenya

