AUDA-NEPAD
AFRICAN UNION DEVELOPMENT AGENCY

AATF
PROSPERITY THROUGH TECHNOLOGY

Enhancing Political Will and Action Essential for Agricultural Biotechnology and Emerging Technologies Towards Africa's Rural Economic Transformation

AATF and AUDA-NEPAD High-Level Round-Table Consultative Meeting Report

28th October 2020

Enhancing Political Will and Action Essential for Agricultural Biotechnology and Emerging Technologies Towards Africa's Rural Economic Transformation

AATF and AUDA-NEPAD High-Level Round-Table Consultative Meeting Report

28th October 2020

AUDA-NEPAD
AFRICAN UNION DEVELOPMENT AGENCY

AATF
PROSPERITY THROUGH TECHNOLOGY

List of acronyms

AATF	African Agricultural Technology Foundation
ABNE	African Biodiversity Network of Expertise
APET	African High-level Panel on Emerging Technologies
AUDA	African Union Development Agency
AU	African Union
AUC	African Union Commission
CAADP	Comprehensive Africa Agriculture Development Program
CBD	Convention on Biological Diversity
CJED	Calestous Juma Executive Dialogue
COMESA	Common Market for Eastern and Southern Africa
COVID-19	Coronavirus Disease 2019
CSOs	Civil Society Organizations
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GMO	Genetically Modified Organisms
MoU	Memorandum of Understanding
NEPAD	New Partnership for Africa's Development
OFAB	Open Forum on Agricultural Biotechnology in Africa
STISA	Science Technology and Innovation Strategy for Africa
PBR	Pod Borer-Resistant
QTL	Quantitative Trait Locus

Table of Contents

Introduction

The High-Level Consultative Roundtable on Agricultural Biotechnology, Innovation and Emerging Technologies for Africa's Rural Economic Transformation that took place on 28 October 2020 was part of the Calestous Juma Executive Dialogue (CJED) Series. The meeting which drew the participation of 128 delegates from over 20 countries across the globe, was conducted virtually, owing to restrictions occasioned by the COVID-19 pandemic. The three-hour consultative meeting set out to achieve the following objectives: -

1. Evaluating the current status of application of agricultural biotechnology & showcasing progress made
2. Identifying challenges besetting the development of the technology, and prioritizing opportunities for leveraging joint collaboration to promote adoption of modern biotechnology and emerging technologies in agriculture and health care.
3. Charting a way forward in support of advancement of crop biotech projects to product commercialization in African countries
4. Exploring potential collaboration in joint support for policy harmonization, education, and awareness creation on emerging technologies.

The participants agreed on a robust Call to Action, contained in Annex 3, which was read at the end of the meeting.

The moderator, Mr. Joe Ageyo took the participants through the programme (See attached Annex 1). He requested members to actively participate in the meeting and pointed out that the meeting was available in two languages; English and French and thus one would switch to the language of their convenience. The Moderator also requested the participants to fill out a survey poll which ran concurrently with the meeting (See attached annex 2).

Welcoming remarks

Dr. Justina Dugbazah opened the High-Level Consultative Meeting and welcomed the participants to the Calestous Juma Executive Dialogue expressing her delight and honor to have members take part. She then gave a brief introduction to the meeting, stating that the Calestous Juma Executive Dialogue (CJED) series was established in honor of Prof. Calestous Juma who was a co-chair of the African Union High Level Panel on Emerging Technologies. She reiterated the objective of the meeting and emphasized that it would provide opportunity for policy and decision makers as well as other stakeholders to share knowledge and experiences on the status of agricultural biotechnology and emerging technologies in Africa. Dr Dugbazah further indicated that the dialogue would provide an opportunity for the participants to discuss the best practices and lessons learnt from existing challenges. She further noted that that the organization of the CJED, which usually involves regional meetings as well as national dialogues, had been altered in the year 2020 due to COVID-19 restrictions. She thanked panelists and participants for creating time to attend the webinar and expressed her desire for a productive meeting.

Proceedings

Opening Remarks

Ms. Jennifer Chiriga - Chief of Staff, AUDA-NEPAD

Ms. Chiriga acknowledged all protocols and then welcomed all participants to the Calestous Juma Executive Dialogue webinar series. Ms. Chiriga stated that technology has been the most important single driver for economic growth since WWII. She hailed biotechnology as an old practice that past generations used to kick-starting the agricultural revolution using artificial selection of crops, livestock, and other domesticated animals. Ms. Chiriga further pointed to the invention of vaccines by Edward Jenner and the discovery of antibiotics by Alexander Fleming as some of the early uses of the power of biotechnology.

Other key messages that came out of her remarks were the following:

- Biotechnology plays a significant role in meeting the demand for industrial and agricultural production as well as medicine globally.
- Although humans have been using microorganisms, animals, plants, and enzymes for millennia, it is only modern biotechnology that has made it possible to optimize them specifically for defined processes.
- Cutting edge biotechnology research is underway to tackle diseases such as cancer, heart disease and Alzheimer's as well as in age reversing technology.
- At policy level, the potential for genetic engineering to make a significant contribution in the development of better healthcare and enhanced food security through sustainable agricultural practices was recognized in Agenda 21 of the United Nations Conference on Environment and Development and in the AU Agenda 2063 and STISA 2024 strategies. The rapid progress of research has raised questions about the consequences of biotechnology advances.
- While the risks of biotechnology have been present for decades, the increasing pace of progress ranging from low-cost DNA sequencing to rapid gene synthesis to precision genome editing suggest that biotechnology is entering a new realm of maturity.
- Many of the benefits of biotechnology are concrete although there were perceived risks. It is thus better to be proactive and cognizant of the risks than to wait until things go wrong and then attempt to address the damage. This therefore calls for more research and development dialogue.

In reaffirming support towards promoting biotechnology, Ms. Chiriga noted that AUDA-NEPAD established The African Biodiversity Network of Expertise (ABNE). This is a continent-wide biosafety service and resource network for African regulators and policy makers. ABNE is an African led and African based initiative conceptualized under the AU's consolidated plan of action and is designed to fulfill the recommendations of the 2007 report by the High level African Union panel on modern biotechnology, 'The freedom to innovate'.

Through platforms such as the Calestous Juma Executive Dialogue (CJED), AUDA-NEPAD supports capacity strengthening for biotechnology and other science technology and innovation stakeholders through informed dialogues that support knowledge sharing such as this roundtable. The CJED draws together specialists and policy makers from multiple disciplines to share knowledge and experience on research in innovations and emerging technologies. The African union high level panel as a continental think tank on innovation and emerging technologies also offers guidance to member states in effectively harnessing biotechnology for Africa's' social economic development through its knowledge products.

Through collaborations, such as that of AUDA-NEPAD and AATF, the continent's development agency, said Ms. Chiriga, stands ready to support agricultural biotechnology solutions whilst promoting a culture that allows responsible regulations without imposing any undue burden on technology adoption. In ending her remarks, Ms. Chiriga wished the participants productive deliberations and expressed AUDA-NEPAD's expectations that the High-level Consultative roundtable meeting would come up with concrete outputs.

Dr. Denis Kyetere - Executive director AATF

Dr. Denis Kyetere acknowledged the participation of different stakeholders. He also thanked the AUDA-NEPAD for partnering with AATF for the roundtable dialogue which is part of the CJED webinar series. Dr. Kyetere referenced the AU technology development report, 'Freedom to innovate' noting that African leaders agreed to promote a critical mass of technological expertise around the continent to exploit the potential of technology for agricultural productivity and enhance care management.

The key highlights from his remarks included:

- Investment in biotechnology development had been unpredictable with many countries lagging behind and few crops getting to advanced commercialization stage.
- The partnership between AATF and AUDA NEPAD and other like-minded organizations is key in pushing for biotechnology development adoption and addressing the challenges being faced.
- AATF is committed to address the operational environment for technology development and uptake through various initiatives such as the Open Forum on Agricultural Biotechnology (OFAB), which is now present in seven African countries.
- AATF is committed to the eradication of hunger and poverty on the continent and the attainment of health and wealth of the people.

He noted that AATF looked forward to the roundtable consultative meeting contributing towards advancing technology which is at the center of Africa's development agenda. He challenged the participants and organizers to generate an action plan which will help the joint work of AATF and AUDA-NEPAD on agricultural biotechnology in Africa as one of the outputs from the webinar.

Keynote Presentations

Dr. Jeremy Ouedraogo – Head of Africa Biosafety Network of Expertise (ABNE)

African Union support to Member States in Building Biosafety Regulatory Systems for the safe use of modern biotech in Agriculture.

In his presentation Dr. Ouedraogo reiterated the sentiments made by Ms. Chiriga on the role of ABNE in assisting AU member states to build functional biosafety regulatory systems. This is aimed at enabling the member states to safely harness, use, deploy and conduct research on modern agriculture biotechnology. He noted that activities carried out by ABNE were in line with the AU's Agenda 2063 , 'The Africa We Want' which is the African continent's blue print for sustainable development and economic growth. He noted that the economies of a majority of African countries were heavily reliant on agriculture and that the AU had, therefore recognized science, technology and innovation as a multifunctional tool and an enabler in achieving development goals.

Dr. Ouedraogo further observed that modern biotechnology and other emerging technologies are regulated by protocols such as the Cartagena protocol on biosafety under the Convention on Biological Diversity (CBD). The protocol provides rules, regulatory materials, and legal frameworks to ensure that modern day biotechnology and emerging technologies are safely used to prevent any harm on humans, environment, and animals. He thus noted that ABNE has been established as a program to strengthen capacity of AU member states with the overall goal being to support the member states in safely harnessing modern biotechnology and emerging technologies through three key areas of support:

1. Creating an enabling legal environment
2. Training regulators, decision-makers and any stakeholders involved to improve a critical mass of regulators to enhance competences.
3. Provide strategic partnerships and learning opportunities for any single member state.

In supporting an enabling environment for policy and legal formulation, Dr. Ouedraogo noted the following:

- ABNE assists AU member countries to develop new policies, regulations, guidelines and reviewing existing national policy instruments.
- The network is assisting AU member states with regional harmonization of the legal and regulatory structures on biosafety. Through this efforts and support from other stakeholders, AU member states have been able to make informed decisions resulting in progress in the individual countries.
- ABNE develops various materials on knowledge products which can be readily accessed by any single member state via the website.

On the regional front, Dr. Ouedraogo acknowledged that a lot had been achieved although there were challenges in bringing together different countries and more so

harmonizing regulations. Citing the example of West Africa, the harmonization has been moved forward to the ministerial level with intentions to form regional economic communities in the continent. The network is also providing support to regulators to establish platforms so as to regularly consult each other and make a common decision or recommendation. West Africa has already formed a forum of biosafety regulators and is now a very useful platform for the member states to share information and experience and make common decisions in one voice.

At the continental level, Dr. Ouedraogo noted that there have been efforts to bring together all the AU member states so that they can easily share information and do trainings for stakeholders and also speak with one voice at international negotiations. Some of the actions taken by ABNE include:

- Taking part in the continental coordination committee on biodiversity, biosafety, and access sharing on biodiversity utilization.
- Conducting trainings and supporting establishment of a continental platform to allow the regulators to meet regularly and ensure decisions and recommendations are supported by AUDA-NEPAD or the AU Commission.
- Supporting experts to be easily accessed by AU member states through the establishment of resource networks which brings food safety experts together to share information.

In his concluding remarks, Dr. Ouedraogo noted that AUDA-NEPAD provided a critical platform for engagement with member states at national, regional, continental levels and even at international levels. He said ABNE is open to offer service delivery and support the establishment of biosafety systems so as to harness modern biotechnology upon request. The goal of the network is to improve policy formulation and establish regulatory frameworks in support of an enabling environment so that any single country can harness biotechnology and ensure that it is used in compliance with its national laws, regulations, and policies.

Dr. Francis Nang'ayo – Head of Policy and Regulatory Affairs, AATF

Delivering Biotechnological Solutions for Africa's Agricultural Transformation: Experiences from AATF

In the presentation, Dr. Nang'ayo acknowledged the invitation to share on the experiences of AATF in developing and deploying biotech crops as a means of addressing agricultural challenges in Sub-Saharan Africa. He kicked off his presentation by sharing the agricultural sector performance for various regions of the world including Africa. This was to provide a context and comparison between Africa and the rest of the world, tracking progress being made within the continent against the other regions on agricultural productivity.

From the FAO data, Europe tops the globe at 6 MT/ha followed by Asia at 4 MT/ha, Latin America at 3.5 MT/ha, with Africa lagging behind in the curve at 1.5 MT/ha. The data reveals decades of stagnation within the

continent despite the recording the highest rates of population growth within the same period than any other region. Dr. Nangayo attributed this to numerous challenges being faced within the continent including:

i. Climate change which has resulted in frequent droughts and other extreme weather events, with the frequency and the impacts expected to increase in the coming years.
ii. Insects and pests' infestation which has become rampant in Africa.
iii. Low soil nutrients and low technological endowment in Africa with an improved crop variety that have been used and recycled for many years.

Dr. Nang'ayo pointed out that AATF was formed to address these challenges and facilitate access to technological interventions including biotechnology. To achieve this objective, AATF implements its partnerships for technological interventions in five phases: identification, brokering, adaptation, delivery, and stewardship. This process involves a concise identification and prioritization of constraints in agricultural productivity which then informs the search and negotiations for access to technology. Dr. Nang'ayo further noted that the process is transparent and fair allowing for royalty freedom and once the license is acquired to access and develop the technology, partners are brought together to test and adapt the technology in compliance with local regulations. This then sets the stage for delivery of varieties that can impact farmers considering a critical aspect of technology deployment called stewardship.

Dr. Nang'ayo highlighted three case studies on climate smart and insect resistant varieties of maize, cow peas and rice.

I. Maize resistant to insects, pests, and drought

In the first case study, he noted that maize was a staple food for an estimated 300 million people in Africa who depended on it directly for food and also for income. In Africa, maize is predominantly grown under rain-fed conditions thus making it vulnerable to moisture stress and drought. Maize also suffers from insect pests such as the stem borer which account to between 15% - 20% yield loss. Citing an example of Kenya, Dr. Nangayo pointed out that stem borers resulted in losses ranging up to 400,000 tons in one year translating to an estimated $90 million. Dr Nang'ayo recounted how in 2008, AATF rolled out a multi-pronged project called WEMA-TELA to develop, test and deploy maize which is, tolerant to drought and resistant to insects and pests using a combination of approaches. The project had three product pipelines:

1. Use of advance plant breeding to better characterize the QTLs responsible for drought with the help of marker-assisted selection and double haploid technology resulting in a conventional hybrid maize which was rolled out under the brand name 'DroughtTEGO'.
2. Genetic modification with genes that could confer into maize the ability for drought tolerance. Under this pipeline, the project was able to come up with genetically modified drought resistant maize which was released under the brand name of 'DroughtGard'.
3. Genetic transformation to confer maize with genes that would result in resistance maize stem borers. This led to the development of Bt maize which was later rolled out under the brand name 'TELA Maize'.

From a study done during the project, it was revealed that genetically modified, Bt maize performed better than non-genetically modified maize with over 33% yield advantage.

II. PBR cowpea project

Dr. Nangayo kicked off by listing the benefits of cowpeas which he hailed as an important source of proteins feeding over 200 million people across the African continent. Cowpeas he noted, is however, susceptible to insect pests such as the Maruca pod borer . From the study, the Bt cowpea resulted in higher yields and this cleared the way for its release for commercialization in Nigeria in 2019.

III. Rice varieties that are nitrogen-efficient, water-efficient and salt tolerant

The third case study cited in the presentation was that of rice with the objective of addressing soil fertility content. Dr, Nangayo stated that the project was currently restricted to three pilot countries: Ghana, Nigeria, and Uganda. The research is being conducted under confined field trials and experts have identified a lead strand which is nitrogen-efficient, and which is undergoing evaluation and regulatory trials before it is cleared for commercialization.

In his concluding remarks, Dr. Nangayo stated that biotech crops had proven their potential for addressing food security and tackling the impact of climate change in Africa. He further pointed out that biotechnology was not the cure for all the agricultural challenges but was a critical tool in addressing challenges in agricultural productivity. Africa needs the right environment in order to harness biotechnology for rural economic transformation.

Dr. Mahama Ouedraogo - Director Human Resources, Science and Technology Directorate AUC.

Dr. Mahama opened his remarks by acknowledging all protocols and expressed his delight to be part of the CJED webinar series. Africa is the second largest continent covering 6% of the world and 20% of emerged land. The continent is also the second most populous with an estimated population of 1.16 billion people translating to 17.44% of the world population. The continent has been experiencing a long and sustained period of economic growth on an average of 6% per annum. The onset of COVID-19 has slowed the economic growth rate, and this may still persist for some time even after the pandemic. This may thus require more complex changes such as improved education, communication, technology connection, physical infrastructure, and market development. To achieve this, there is need to carry out research which is imperative to increased productivity.

Africa is facing quite a number of challenges that are multi-faceted, interlinked and they cut across borders and not unless individual member states join hands together, it may be difficult to address the challenges at a national level. Some of the key areas of importance include agriculture, natural resource and water, energy, blue economy digital infrastructure, climate variability, disaster risk reduction and the SDGs. Dr. Mahama justified the need to transform African agriculture noting that the high population growth has necessitated increased food production on less land so as to meet the demand. There is

therefore high expectations from agriculture in a more challenging environment to be able to address these challenges and supply Africans with enough food for consumption.

Agenda 2063 has clearly outlined the issues of transformation, modernization, and mechanization of African agriculture. Dr. Mahama pointed out that the first aspiration of Agenda 2063 is a prosperous Africa based on inclusive growth and sustainable development in member countries. The modernization of agriculture will thus lead to increased productivity and production. Other key issues to be considered include:

- Agricultural value addition and agribusiness development
- Environmental sustainability and climate resilient economies and communities
- Blue economy for accelerated economic growth,
- Renewable energy, and
- Biodiversity conservation and sustainable natural resource management.

Agenda 2063 provides a certain number of strategies to aid in the achievement of targets of eliminating poverty, inequality, and hunger at national, regional, and continental levels. Some of the strategies he cited include:

National level

i. Full implementation of CAADP and signing of inclusive national agricultural development plans,
ii. Promote policies which will ensure access to affordable and quality food for all.
iii. Promote market-based policies for the establishment of strategic food stocks/ reserves.
iv. Implement Africa nutrition strategy.
v. Eliminate the taxation on the importation of grain to reduce food costs.
vi. Develop and implement energy generation policies that will contribute to increased productivity among rural households.
vii. Promote commercialization of traditional high nutrition and drought resistant grains and crops.

Continental/regional

i. Develop and implement frameworks to facilitate trans-boundary food transportation by reducing not-tariff barriers.

Dr. Mahama delved further into the Comprehensive Africa Agriculture Development Programme (CAADP) noting that its first declaration was made in 2003 in Maputo, Mozambique. The commitment of CAADP was renewed at the Assembly of AU in 2009 and reaffirmed in 2014 in Malabo, Equatorial Guinea. The Programme sets principles and has broadly defined strategies to help countries to review their own situations and identify investment opportunities with optimal impact and returns. Some of the activities that CAADP has been involved in include:

- Championing for reforms such as ensuring a 6% annual growth in agricultural GDP and an allocation of at least 10% of public expenditure to the agricultural sector.
- Creating job opportunities especially for women and youth
- Promoting food security and improved nutrition and strengthening resilience.
- Assisting African countries to develop their National agricultural investment plans.

In order for the continent to unlock the untapped potential in science and technology, Dr. Mahama listed the following areas for consideration:

i. Improved precision farming through space-based technology and monitoring systems
ii. Providing efficient delivery systems for water, nutrients, and pesticides
iii. Smart food processing and improved seeds.

Dr. Mahama also referred to the Science, Technology, and Innovation Strategy for Africa 2024 (STISA 2024) which is a continental strategy with key components on agriculture and eradication of hunger. The strategy ensures that there is capacity and that it is put into use in research and resolution of challenges faced by Africa.

In concluding his presentation, Dr. Mahama noted that in the 90s when the negotiations on the Cartagena protocol stalled, the AU was engaged in developing the OAU model laws on safety in biotechnology and regulation of access to biological resources. In July 2003 in Maputo, the 3rd AU Executive Council took a decision on the need for an Africa-wide biosafety capacity. The member states were expected to equip themselves with the necessary human and institutional capacity so as to deal with biosafety issues. In 2011, the African model law was revised taking into consideration developments at the national, regional, and continental levels on emerging issues in science and technology. In 2011, the 16th AU assembly agreed to include biodiversity among the Priority areas of the AUC. On January 2016, the Assembly decided to establish the African High-level Panel on Emerging Technologies (APET) and directed AUDA-NEPAD and the AUC to advise member states on technology questions.

The AU summit endorsed the High-level Panel Report on Modern Technology, 'Freedom to Innovate' report, which encourages the safe application of biotechnology. According to Dr Mahama, the application of new molecular biotechnologies and new breeding strategies to crops and livestock breeds is more urgent than ever given the current unpredictable weather conditions and hence climate change. Dr. Mahama concluded by emphasizing the need to put in place guidelines on the use of biotechnology in Africa. He also encouraged members to establish the status of biotechnology and biosafety development and use in order to determine the extent to which member states have implemented international instruments that offer guiding principles on biotechnology, identify the challenges faced and offer proposals on how they can be addressed.

Panel discussions

Policy and Regulation

Dr. John Mukuka - Seed Development Expert, COMESA

Topic: Regional Harmonization of Biotech Policies and Regulations: Challenges and Opportunities (COMESA)

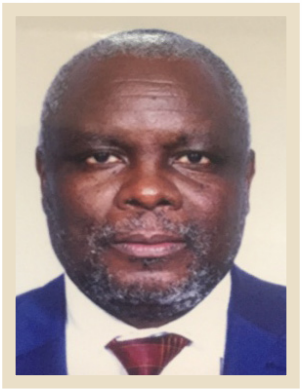
In his presentation, Dr. John Mukuka noted that in the last 9 years the regional trade bloc, COMESA had come up with policies on biotechnology and biosafety with the overall goal being to create awareness, conduct outreach activities on a regional biosafety risk-assessment mechanism and capacity building for biosafety regulation and biotechnology research and product development/testing at Member States level. Dr. Mukuka noted that COMESA has been able to provide a platform for its member countries to consider what is in their best interest. There is therefore need for more knowledgeable people equipped with the scientific facts to come into the picture and lead the regional and continental process.

Some of the key messages from his presentation were the following:

- COMESA has taken the lead in biotechnology in the region and of the 7 African countries that have commercialized biotech crops, 5 of them are COMESA member States (Sudan, Ethiopia, Swaziland, Malawi and Kenya).
- The region was considering setting up centers of excellence on biosafety with the conversation starting at the national level through synchronizing the various legislations.
- A Panel of Experts will then move this to the regional agenda and should be driven by a product of interest among several countries e.g Bt cotton.
- Regional harmonization should take place in phases, starting with those countries that are ready and have the potential and interest to commercialize a product.
- It is also critical to develop standard operational procedures and to standardize application forms and experimental procedures to allow for data transportability among the countries.

In his concluding remarks, Dr. Mukuka pointed out that COMESA had developed a Biotechnology Implementation plan to measure progress of implementation and this was linked to the Panel of Experts on Biotechnology and Biosafety, Standard operating procedures for the Regional Biosafety Risk Assessment Mechanism and Database for risk assessors and GMO risk-assessment subcommittees. This will be done in close collaboration with Member States, farmers' associations, the media, private sector, biotechnology/biosafety service providers and Civil Society Organizations (CSOs).

Prof. Dorrington Ogoyi - Chief Executive Officer, National Biosafety Authority, Kenya.



Topic: Domesticating international biosafety protocols to enhance country level regulatory oversight; the role of peer reviews

Prof. Ogoyi's presentation focused on the domestication of the Cartagena Protocol on Biosafety to enhance country level regulatory oversight in Kenya. He noted that Kenya was one of the early signatories to the Cartagena protocol signing it in 2000 and ratifying the same in 2003. In the subsequent years, Kenya has enacted a biosafety law known as the Biosafety Act 2009 which led to the establishment of the National Biosafety Authority. A number of biosafety regulations have also since been rolled out to give effect to the legislation, including The Biosafety (Contained Use) Regulations (2011); The Biosafety (Environmental Release) Regulations (2011); The Biosafety (Export, Import and Transit) Regulation (2011); and The Biosafety (Labeling) Regulations (2012).

The objectives of the Biosafety Act. 2009 were elaborated and the functions of the National Biosafety Authority outlined, and they include establishment of transparent, Science based and predictable process of review, communication and consultation with the public and relevant stakeholders and establishment of monitoring structures for compliance with approval conditions at experimentation phase and post release phase.

Some of the key highlights from Prof Ogoyi's presentation were the following:

- Since 2010, the authority had made 33 contained use approvals, carried out 14 confined field trials and made decisions on 3 environmental release applications e.g. Bt cotton which has already been approved and is currently undergoing farm level trials.
- Authority was among the leading in Africa to approve genome editing and has currently approved six genome editing projects.
- Political setbacks such as the ban on GMO food imports imposed in 2012 and is still in force has hindered the full exploitation of biotech potential in Kenya.
- The Cabinet allowed the cultivation of Bt cotton and also made a decision to address other crops on a case-by-case basis.
- Technology has a role to play and thus there is need to include it as an option in addressing the constraints experienced in agricultural productivity.

Prof. Mohammed Ishiyaku- Institute for Agricultural Research in Nigeria (IAR)

Enhancing the biotech research process in Africa – Lessons from PBR Cowpea commercialization in Nigeria

Prof. Mohammed Ishiyaku's presentation focused on the Nigerian experience in the development of the Bt cowpea also known as the pod borer resistant (PBR) cowpea. The cowpea is an important crop in most countries in Africa providing a ready source of proteins among other benefits. Africa produces about 6.7m tonnes of cowpea and about half of this comes from Nigeria even it has not been able to equal the demand. One of the contributors to the deficit of cowpeas in Nigeria is low productivity, driven in large part by pod borer infestation. Pod borers such as *Maruca*, cause losses of up to 90% depending on the intensity of infestation in the field. For years, insecticides have been used to help curb the infestations, but this has not been sustainable because they are not readily available, they are expensive and are harmful to the environment.

Prof. Ishiyaku noted that genetic transformation of the crop had yielded promising results. He explained the scientific process behind the genetic modification of cowpeas. From the results collected, the Nigerian government and its regulatory bodies were convinced of the efficacy on the pod borer resistant cowpea. Prof Ishayaku explained that the project passed the requisite regulatory requirements and was issued with an environmental safety certificate. The cowpea has since been registered as a variety and farmers have already conducted field trials with impressive yields.

In his concluding remarks, Prof. Ishiyaku took participants through the lessons learnt from the project;

i. Political commitment from the Nigerian government and local leaders
ii. Human capacity building in science and communication of science
iii. Impactful solutions- the development of pod borer resistant cowpea
iv. Infrastructure such as laboratories and equipment
v. Access to critical materials and logistics.

He noted that strong partnerships driven by political commitments had led to the development of an environmentally friendly and sustainable solution to the perennial problem of 80% yield-reducing pod borer insect in cowpeas. Biotechnology stands to provide a potential solution to many of the agricultural and food productivity problems.

Ms. Lieketso Moremoholo - Likarabelo Tsa Machale (LTM) Pty Ltd

Topic: Agricultural Biotechnology: The needs from the private sector

Ms. Moremoholo shared her experience on the challenges and the role of the private sector in accessing and deploying agricultural biotechnology. She noted that the challenges often led to reduced yields especially among smallholder farmers. These challenges include drought, poor soil fertility and inability to purchase fertilizer, inability to purchase certified seeds, and poor agro-economic practices e.g., weed and stalk borer. She pointed out that the TELA project had availed Bt maize seeds to farmers and that the variety did not require frequent spraying as compared to the conventional one . To accelerate the deployment of the hybrid seeds, Ms. Moremoholo recognized the key roles played by radio programs, field demonstrations, field days and agricultural shows and workshops in accelerating the pace of biotechnology adoption among farmers. Ms. Moremoholo noted that the private sector had made hybrid sees more accessible to smallholder farmers and delivered the promise of increased productivity and reduced production costs.

Some of the key challenges being faced by the private sector in advancing agriculture biotechnology include:

i. Inadequate funding as a key limitation to marketing promotions, demonstrations, and seed production
ii. Misconceptions among smallholder farmers on biotechnology products
iii. Government delays in enacting biosafety laws and regulations
iv. Lack of local seed outlets

In regard to supplying seed to the farmers, Ms. Moremoholo noted that the private sector had developed a testimonial basket for farmers to showcase the benefits of agricultural biotechnology in general and Bt Maize in particular. In her concluding remarks, she called for more effort in ensuring greater adoption of agricultural technologies as a way of assuring long term food security on the continent.

Ms. Patience Koku – CEO Replenish farms, Nigeria.

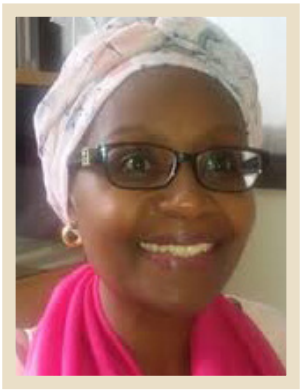
Topic: Benefits of growing Biotech products from a farmer's perspective

Ms. Koku expressed her delight to be part of the conversation and share her experiences from a farmer's perspective. She noted that food systems in Africa faced many challenges and farmers got to experience the impacts first hand. Among the challenges she cited was the issue of diseases and pests such as the fall armyworms and ***Maruca.*** Ms. Koku explained that she had already purchased the PBR cowpea and had planted it in her farm. The crops she reported were at an advanced stage with pods already forming and acknowledged that the economic potential was greater, with reduced costs of spraying the crops. She further noted that Africa was experiencing food shortages and that there was need for regulators to prioritize approvals for

Bt. She also emphasized the need for urgency in addressing the numerous barriers that hamper farmers' access to agricultural technologies. She concluded by underscoring the importance of collaborations and partnerships to accelerate the pace of adoption of these technologies by farmers.

Advocacy, Education and Awareness

Ms. Nancy Muchiri - Head of Communications and Partnerships at AATF



Topic: Shaping public perceptions on Agricultural Biotechnology

Ms. Muchiri in her presentation, focused on the critical question of public perceptions on biotechnology. She noted that public perceptions such as risk perception went beyond scientific facts, explaining that ethical and social concerns also played a key role in shaping public sentiment. Ms. Muchiri underscored the need for trust building to enable scientists, policy makers and other stakeholders to address the fears and the misconceptions. She pointed out that many of the fears were driven by inadequate information especially in instances where public participation and clear communication have not been prioritized. She indicated the pressing need to consider, peoples' values such as health, financial security, environment, quality of life, safety, and status quo. Ms. Muchiri further pointed out that the ability of people to make decisions was influenced by their own judgments, values, expertise and interests, and that facts and expert opinions alone were not sufficient to clear doubts and misconceptions.

Ms. Muchiri explained that building support for agricultural biotechnology was critical in shaping and informing decision making and how people view and think about biotechnology and specifically GMOs. OFAB is thus a community platform present in 7 African countries; Kenya, Uganda, Tanzania, Ethiopia, Ghana, Nigeria, and Burkina Faso. Ms. Muchiri reiterated the commitment of the forum to building awareness and understanding of biotechnology in addition to contributing to an enabling environment. This is done through trainings, dialogues and conferencing, regular meetings with members and stakeholders such as policy and decision makers so as to address the pertinent issues. In the 14 years that OFAB has been operational, there have been notable achievements in policy formulation, release of GM products, an increase in demand on GM products, an increase in favorable media mentions, and diversified support base towards biotechnology and issues management by decision makers.

In sharing the key lessons learnt from OFAB's experience across Africa, Ms. Muchiri noted the following:

- Government led and country specific processes of informing its citizens on biotechnology was important as it promoted ownership, buy-in, networking and collaboration.
- There should be targeted strategic actions so as to help realize value for money for any investment made.

- There is need for continuous capacity building which can be done through trainings, exposures and sharing knowledge products.
- There is need to advance storytelling and media collaboration to draw experiences from farmers and other stakeholders from across the continent.
- The delay in deployment of agricultural biotechnology products in Africa is more of a challenge of low political support than of research and development.

Mr. Mohammed Nasiru - Center for Initiative and Food Security and Environment (CIFSE)

Topic: Ethical Agricultural Biotechnology Communication: Views from CSO

Mr. Mohammed Nasiru noted that there have been upheavals in various African countries mainly because of shortage of food. He acknowledged the efforts already made by African leaders such as the key declarations Malabo and Maputo. He hailed the decision by African leaders agreed to commit 10% of their budgetary resources to support agricultural development and recognized biotechnology as a way of addressing food insecurity and poverty in Africa. Mr. Nasiru acknowledged the need to carry out sensitization and awareness creation activities on agricultural biotechnology. He shared his personal journey as a critic of biotechnology and his eventual encounter with scientists who gave him a better understanding and changed his perspective. Mr. Nasiru challenged participants to tap into the full potential of biotechnology noting that Africa would thus be able to produce enough food for its citizens and for export.

Discussion Session

The discussion session aimed at getting reactions, responses and questions from the participants and also allowed panelists to address the issues raised. The issue of resources to support young African researchers in agricultural biotechnology at Africa Union level was raised. It was noted that while resources for agricultural research in biotechnology can be raised at any level, the ultimate responsibility falls on the national governments to translate the enabling environment created by the African Union into actionable plan to build human capacity, training, endorsing emerging technology areas, building infrastructure, and advancing science research. The other issue that arose was on policy balance between good management of agricultural land and dependence on GMO products for Africa's food security. The conclusion on this particular issue was that agricultural biotechnology should be considered as one of the tools in the toolbox and not as a solution to all agricultural challenges in Africa. Currently, the uptake of agricultural biotechnology is not optimal as such Africa is not realizing the full potential of the technology. The issue of technology going ahead of regulation in Africa came up, and it was noted as challenge but in such cases, the emerging technologies will still be evaluated against the existing regulations. A good example Gene-editing is a new technology and in most country the technology is evaluated under the GMO regulation for containment. There was an emphasis that for agricultural biotechnology to advance there is need for the regional harmonization of the regulations, policies, and legal frameworks. The same should apply to climate change response mechanism to be harmonized at regional level. COMESA has a support facility to help member states to harmonize its policies with the regional frameworks on agricultural biotechnology. Member states will need to express interest to access this support. However, it is important that member states have policies which ensure that the interests of other members states are also taken into consideration. Harmonization of policies will promote transparency and strengthen information sharing and enhance shared learning among member states. The issue of promotion agricultural biotechnology was brought up with a specific question on how to influence policy makers to consider agricultural biotechnology in development planning. In response to this question, the panelist expressed the need for participatory development planning from the start. An example of Nigeria was given where success was registered primarily because politicians and policy makers were involved from the start. In order to advance agricultural biotechnology in Africa it was noted that particular elements are important. Firstly, there is need for enabling policies which should be resourced for optimal implementation. Secondly, there is need for political support, as executive orders have been used to hamper progress of agricultural biotechnology in some countries. Thirdly, it was noted that progress in advancing agriculture as a business has potential to incentivize the adoption of technology as enabler for increased productivity which is essential for mass and quality production. Lastly there is a serious need for collaboration and linkages between policy, investment, capacity building and necessary infrastructure for agricultural biotechnology. The discussion also noted that anti-GMOs activism is growing in Africa particularly in Universities even among teaching staff. There is need to expand the arena of research and enhance support for capacity building.

Call to Action

Pursuant to the presentation and the rich discussion a Call to Action (CTA) which culminated the progress, challenges, and way forward for agricultural biotechnology in Africa was read by the facilitator Mr. Joe Ageyo. The Call to Action was adopted to inform the next course of collaboration between AATF-NEPAD to advance agricultural biotechnology in Africa. See the CTA as Annex 3. Mr. Ageyo thanked all the panelists and participants for taking their time to attend the AATF-NEPAD High-level Consultative Meeting on Agricultural biotechnology in Africa. He then called the meeting to an end.

Annexes

Annex 1. Programme

Calestous Juma, Executive Dialogue Webinar Series: AATF-NEPAD High-Level Consultative Roundtable Meeting on Agricultural Biotechnology, Innovation and Emerging Technologies for Africa's Rural Economic Transformation

AGENDA

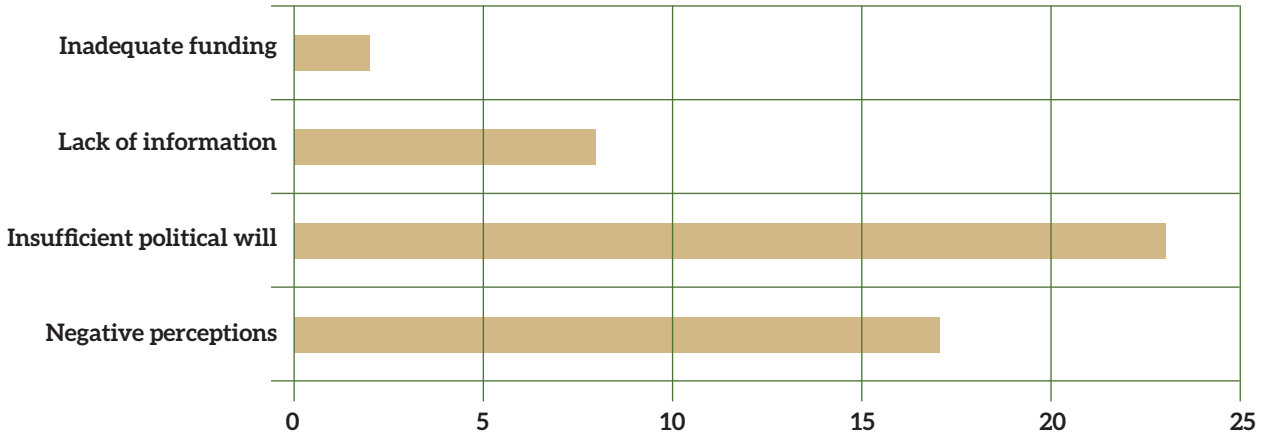
Time	Subject Matter	Moderation
12:00-12:15 GMT	***Opening Remarks***	**AUDA-NEPAD AATF**
12:15-13:00 GMT	***Keynote Presentations*** 1. ***12:15-12:30:*** **Dr Mahama Ouedraogo, AUC** Director of the Human Resources, Science and Technology Directorate, AUC 2. ***12:30-12:45:*** **Dr Jeremy Ouedraogo,** Head of the African Biosafety Network of Expertise, AUDA-NEPAD *African Union support to Member States in Building Biosafety Regulatory Systems for the safe use of modern biotech in Agriculture* 3. ***12:45-13:00:*** **Dr. Francis Nang'ayo, Head of Regulatory Affairs, AATF.** *Delivering Biotechnological Solutions for Africa's Agricultural Transformation: Experiences from AATF*	**Joe Ageyo**
13:00-14:10 GMT	***Panel Discussions:*** *Challenges of the agricultural biotechnology development and opportunities for leveraging joint collaboration to promote adoption of modern biotechnology and emerging technologies in agriculture and health care.* ***Policy and Regulation*** 1. *Regional Harmonization of Biotech Policies and Regulations: Challenges and Opportunities (COMESA). COMESA,* **Dr. John Mukuka** 2. *Domesticating international biosafety protocols to enhance country level regulatory oversight; the role of peer reviews – National Biosafety Authority in Kenya (NBA), Kenya,* **Professor Dorrington Ogoyi**	**Joe Ageyo**

Time	Subject Matter	Moderation
	Research and Deployment 1. *Enhancing the biotech research process in Africa – Lessons from PBR Cowpea commercialization in Nigeria – Institute for Agricultural Research in Nigeria (IAR).* **Professor Mohammad Ishiyaku** 2. *Agricultural Biotechnology: The needs from the private sector – Likerabelo Tsa Machale (LTM), South Africa,* **Lieketso Moremoholo** 3. *Benefits of growing Biotech products from a farmer's perspective – Replenish Farms* ***Nigeria,*** **Ms. Patience Koku** ***Advocacy, Education and Awareness*** 1. *Shaping public perceptions on Agricultural Biotechnology- Experiences across Africa – Open Forum for Agricultural Biotechnology in Africa (OFAB), AATF,* **Ms. Nancy Muchiri** 2. *Ethical Agricultural Biotechnology Communication: Views from CSO - Center for Initiative and Food Security and Environment – CIFSE*, **Mr. Mohammed Adams Nasiru**	
14:10-14:40 GMT	**General Discussions**	**All**
14:40-14:50 GMT	Call to Action/Collaboration/Way forward	**Joe Ageyo**
14:50:15:00 GMT	Wrap up & Closing Remarks	**AATF AUDA-NEPAD**
15:00 GMT	**End of Day**	

Annex 2. Survey poll results

What is the main reason behind the slow adoption of biotechnology in Africa?	
Negative perceptions	17
Insufficient political will	23
Lack of information	8
Inadequate funding	2

Graphical representation



	Negative perceptions	Insufficient political will	Lack of information	Inadequate funding
	17	17	17	17

Annex 3. Call to Action

Call to Action for Collaboration to Support Agricultural Biotechnology

Theme: Enhancing Political Will and Action Essential for Agricultural Biotechnology and Emerging Technologies Towards Africa's Rural Economic Transformation.

28 October 2020

Preamble

Since 2003, the commitment of African leaders to the realization of CAADP goals has been unequivocal. This commitment was reaffirmed in 2014 with the adoption of the Malabo Declaration on Accelerated African Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihood. Other key stakeholders such as the private sector and development partners also committed to align to CAADP. To sustain this momentum, African leaders resolved to promote programs that would generate a critical mass of technological expertise in targeted areas to exploit the high growth potential from biotechnology to develop Africa's rich biodiversity, improve agricultural productivity and develop healthcare products through the New Partnership for Africa's Development (NEPAD) framework.

Despite the considerable potential of biotechnology to address socio-economic development challenges, its uptake and use has been painfully slow. Investment in agricultural biotechnology research and development remains unpredictable, with majority of countries lagging and only few crops advancing to commercialization. AATF and AUDA-NEPAD, organized a meeting to reflect on progress, assess the challenges and develop a joint plan of action to enhance political will, efforts and actions in advancing agricultural biotechnology and emerging technologies for rural socio-economic transformation in Africa.

Discussion

The participants at the High-level Consultative Meeting deliberated on the call by African leaders to integrate and put science, agricultural biotechnology and emerging technologies at the center of development planning for rural transformation.

We, the participants at the High-Level Consultative Round-Table Meeting on Agricultural Biotechnology in Africa therefore:

- Welcome with appreciation, many efforts and initiatives at local, national and regional levels that are promoting agricultural biotechnology and other emerging technologies and encourage their integration into the national development frameworks for sustainability.
- Reaffirm the commitment to work in partnership in promoting and enhancing agricultural biotechnology and emerging technologies to support the socio-economic development in Africa towards achieving the Sustainable Development Goals (SDGs).

- Recognize the efforts and commitments by African Union (AU) member states, African Union Development Agency (AUDA-NEPAD), Regional Economic Communities (RECs) and development agencies, to enhance agricultural biotechnology development through regional and national investments and incentivizing the enabling environment through regional integration.
- Reiterate that while there is progress in agricultural biotechnology development, noticeable gaps remain in enhancing its optimal utilization to enable Africa to realize maximum benefits to transform rural economies.
- Emphasize the need for sustained political will and transformative approach to address policy, regulatory and institution barriers, gaps and challenges currently impeding the development of agricultural biotechnology in Africa.

Call for action

AATF, AUDA-NEPAD, respective partners and participants are encouraged to continue to support efforts by African Union member states, Regional Economic Communities (RECs) and Development agencies to:

1. Raise awareness and increase knowledge through public engagement with a view to changing the narrative about agricultural biotechnology by focusing on its benefits such as food security, nutrition, climate resilience, preservation of biodiversity and rural social and economic transformation.
2. Enhance collaboration with media, civil society in accordance with the relevant provisions of the Cartagena Protocol on Biosafety to improve public communication, education and participation.
3. Strengthen and harmonize biotechnology policies and biosafety regulations towards the creation of sustainable enabling environment for biotechnology development in Africa.
4. Hold annual and special consultative meetings as the need arises in order to deliberate on emerging issues with a view to proactively addressing issues besetting biotechnology to enhance agricultural development.
5. Expand the agricultural biotechnology partnerships, networks and alliances to actively engage and integrate the development agencies, non-governmental organizations, civil society organizations, policy and decision makers, and private sector in deliberations to enhance knowledge and capacity in biotechnology.
6. Support and strengthen South-South and North-South collaboration in research, capacity strengthening, including seed systems and science, technology, and innovation (STI) development programs.
7. Continue to support the value chain system of biotechnology products from research to commercialization.

HEADQUARTERS
ILRI Complex,
Naivasha Rd, Nairobi
P.O. Box 30709 - 00100,
Nairobi, Kenya
Tel: +254 (0)20 422 3700
Email: aatf@aatf-africa.org
Website: www.aatf-africa.org

AUDA-NEPAD Agency
230 15th Road
Midrand
South Africa
Tel: +27 11 256 3600
Email: info@nepad.org
Website: www.nepad.org