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IN THIS EDITION

Modern agricultural innovations are solutions to agriculture

- *Taraba Governor*

The Executive Governor of Taraba State, Arc. Darius Dickson Ishaku.

The Executive Governor of Taraba State Architect Darius Ishaku has buttressed that it is essential to note that modern agricultural innovations are parts of the solutions to agriculture rather than the problems.

This is why public investment in modern agricultural research and innovation is so important. Joint programming Initiatives, Innovation and partnerships, will be instrumental in achieving a better coordination of these efforts.

In his remarks at the North-East Zonal 2017 hosting of the Open Forum on Agricultural Biotechnology (OFAB) in Africa, Nigeria Chapter awareness programme at the Jolly Nyame Stadium, Jalingo, Taraba State, Tuesday, 20th June 2017.

The Governor who was represented by the Head of Service, Mr Simon Istifanus Angyu said the passage of the National Biosafety Bill and signing into an Act is a firm commitment to that effect as this will allow the safe application of Modern Agricultural biotechnology in Nigeria.

"The current government under the leadership of President Mohammadu Buhari has promised significant investment in Agricultural science to boost food and industrial production and also encourage

the private sector to do same", he said.

"It is also making efforts through the policy frameworks that Nigeria desperately needs to diversify her economy and the way to go is the way of agriculture. Any nation that runs a mono-economy today is heading for doom, it is only a matter of time", he decried.

"At this point I would like to commend the efforts of the current administration under the leadership of President Muhammadu Buhari, who at the assumption of office recognized the urgency of the need to diversify the Nigerian economy through agriculture for solid economic growth", he highlighted.

"Deliberate efforts were made on the part of government to encourage scientific incursion into agriculture via policy measures specifically designed to encourage research and development and adoption of new technologies", he added.

"As laudable as diversification of the economy into Agriculture seems, let me also remind you that the challenges of today's world have brought many pressures to bear on agriculture: population growth, insects and pests infestation of crops, weed invasiveness, soil infertility, salinity, the impact of climate change (drought and rise in temperature), the need to reduce greenhouse gas emissions, water and energy shortages. This scenario heightens the critical role of innovation to make agriculture a business, more competitive and sustainable. Without innovative advances such as biotechnology in agriculture, far more land would need to be cultivated to produce the food we need today. The world's population is estimated to be at about 9.7 billion by 2050. If agricultural yields stay the same, we would need to cultivate more than double the present amount of land to feed that population. That's 82% of our total land area on earth", according to him.

Taraba State Head of Service, Mr. Simon Istifanus Angyu, representative of The Executive Governor of Taraba State, Arc. Darius Dickson Ishaku

Taraba State Commend OFAB on Technology Awareness

The Deputy Governor Taraba State Engr. Haruna Manu has commended the Open Forum on Agricultural Biotechnology (OFAB), Nigeria Chapter for coming to Taraba State to sensitize its citizens on the use of technology to improve agricultural produce.

In his remarks at a courtesy visit by the OFAB Nigeria Team to Taraba State Government House during the North-East Zonal 2017 hosting of the Open Forum on Agricultural Biotechnology (OFAB) in Africa, Nigeria chapter awareness programme at Jalingo, Taraba State, 20th June 2017.

He said "We are happy you are here to sensitize and also encourage our people on the use of technology, we are happy about this, we support you, and we will continue to support all agencies that are helping to sensitize our people on the use of technologies, because we know that to move agriculture to the next level, we have to adopt technology, this is in line with the policy of Mr. President", he said.

"We in Taraba State want to assure you that we have embraced it, we will continue to support all individuals that are ready to adopt technology in order to take agriculture to the next level", he noted

"You have seen our green house, the idea behind it is to take it to all our local governments, by the time you come back to Taraba State next year, some other local Governments would have embraced the greenhouse", he added.

"The state government has been supporting your Bioresource Centre, you made mention about culvet construction in your remarks but we are going to construct blocks of class rooms for the Centre, this is to encourage the Centre, because we want to take agriculture to the next level, we cannot continue to do it the way we are used to. We have to adopt technology and we believe that with the Bioresource Centre in Taraba, they would be able to help us to the next level", the Deputy Governor reiterated.

"On behalf of the Governor I welcome you to Taraba State and hope that next year when you come back to Taraba State you will see progress on what you have sensitized our people", he ended his remarks.

Engr. Haruna Manu, Deputy Governor, Taraba State

Nigeria is still low paced in biotechnology
- *DG NABDA*

The Director-General National Biotechnology Development Agency (NABDA), Professor Lucy Ogbadu has disclosed that whilst many countries are benefitting immensely from the dividends of biotechnology, Nigeria is still slow paced.

In her remarks at the North-East Zonal 2017 hosting of the Open Forum on Agricultural Biotechnology (OFAB) in Africa, Nigeria Chapter awareness programme in Jalingo, Taraba State. She said "I charge countries in Africa to move from resource base technology to knowledge base as no country becomes great without science and technology. Biotechnology is another facet of science and it is science that has made the world a global village".

"Nigeria has the finest opportunity to key into it now to be able to feed herself and grow her economy"

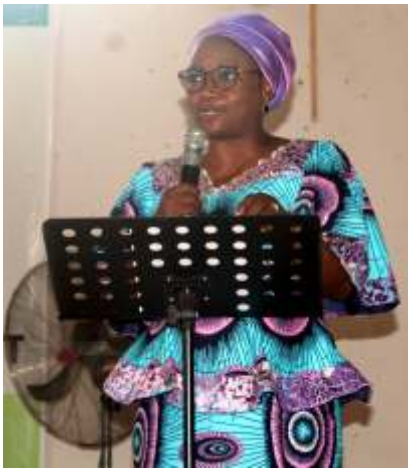
"Science delivers tangibles and facts that can't be dismissed with emotions. You can only dismiss scientific facts with more scientific motions", Agric biotech is the future for African Agriculture. No nation becomes great without science and technology. I urge media to report science based on evidence and facts", she explained.

"Following the sudden fall in the price of oil by more than 50% since June 2014 when it was $115 a barrel, which now is below $45, after five years of stability, it is a well-known fact that Nigeria's continuous large earnings or revenue from this sector will be impossible. As a matter of fact, there is an urgent need for the Nigerian government to begin to look into diversification of various sectors of the economy so as to attain solid economic growth, Agriculture is of course one sector that is topmost on Mr. President's Change Agenda", she enthused.

"The agricultural sector will enhance provision of food and industrial raw materials especially the Textile industry and manufacturing sector, for the benefit of Nigeria's teaming population, job and wealth creation. This will in turn discourage heavy dependence on Importation and crude oil", she said.

"For us to really achieve this, we have to make agriculture a business and how do we make it a business? Of course, it is by the application of pervasive technologies like modern biotechnology in agricultural practice, expanding the value chains, increasing productivity and competitiveness for global standards in quality". Professor Ogbadu said.

"Biotechnology is a powerful scientific tool which that is changing the way we do things. It is simply defined as the use of living organisms such as microorganisms (bacteria or yeasts, as well as enzymes), plants/animals, to perform specific industrial or manufacturing processes. The applications include the production of certain drugs, synthetic hormones (e.g. Insulin), insect and pest resistant crops, nutritionally enhanced crops, drought tolerant crops, climate smart crops and as well as the bioconversion of organic waste into bioenergy (biogas, bioethanol) and the use of genetically altered bacteria in the clean-up of oil spills", she explained.



Prof. Lucy Ogbadu, Director-General/ CEO NABDA

"Application of biotechnology in the agricultural sector would help in alleviating problems currently faced by our local farmers especially, with the growing concern about the environmental impacts of large scale use of insecticides and pesticides and the campaign launched to reduce the use of such chemicals", she buttressed.

The Future of Nigeria depends on Biotechnology
- *VC, Taraba State University*

The Vice Chancellor, Taraba State University, Jalingo and Chairman, Board of Trustees (BOT), Biotechnology Society of Nigeria, Prof. Vincent Ado Tenebe disclosed that the future of Nigeria depends largely on application of biotechnology.

In his remarks at the North-East Zonal 2017 OFAB in Africa, Nigeria Chapter awareness programme at the Jolly Nyame Stadium, in Jalingo, Taraba State. Prof. Vincent Tenebe counted Taraba lucky to be one of the beneficiaries of the technology.

He therefore advised participants to pay keen attention to the programs and presentations since information is very important to better the state of agriculture in Nigeria. He congratulated the organizers of the event for a successful outing.

Prof. Vincent Ado Tenebe, VC, Taraba State, University

Taraba State Expresses Willingness to Embrace Agric Biotech

The Honourable Commissioner of Agriculture and Natural Resources Dr. David Ishaya have disclosed Taraba State's willingess to embrace agricultural biotechnology in line with the existing agricultural improvement.

In his remarks at the North-East Zonal 2017 Workshop in Jalingo, he said that the Taraba State Ministry of Science and Technology is willing to embrace this unique tool in addition to its existing agricultural improvement programs to make us achieve economic growth and improved yield.

The Commissioner lamented that the status of agriculture in Nigeria since conventional methods of crop improvement can no longer meet the needs of our population. He further stated that current government under the leadership of President Mohammadu Buhari has promised to apply science to boost food and industrial production and creation of wealth and improvement of the quality of health for all.

Dr. David Ishaya welcomed participants to the Event. He commended the efforts of OFAB in sensitizing the general public on the potential of biotechnology and more importantly for coming to Taraba State. He added that OFAB's initiative has helped Nigerians identify their need for improved agricultural technologies and recognize where they stand in the scheme of things in terms of the effort to achieve global food security through sustainable agricultural practice in a knowledge based economy.

He appreciated the efforts of NABDA, OFAB and all other development partners who are making efforts to create access to improved technologies for farmers. He also wished the participants a successful deliberation and safe trip back home.

Biotechnology has tremendous potentials - *ARCN*

Similarly, the Acting Executive Secretary of the Agricultural Research Council of Nigeria (ARCN), Prof. A.A. Voh defined biotechnology as a tool with tremendous potentials. In his remarks at the North-East Zonal 2017 awareness Workshop programme at Jalingo, the Executive Secretary ARCN who was represented by the Ag. Director, Partnership and Linkages, ARCN, Mr. Yarama Ndirpaya expressed optimism that very soon, farmers and grassroots in Taraba State will access the crops.

Speaking further, Mr. Ndirpaya said ARCN has the mandate of coordinating and regulating the activities of all research institutes in Nigeria. "ARCN coordinates 15 agric institutes and 4 international research institutes including IITA, Harvest Plus, International Livestock Research Institute (ILRI) and International Crop Research Institute for the Semi-Arid Tropics (ICRISAT). "We believe in technologies that will improve productivity and I am glad that Taraba is hosting this event to see what is on ground and tap the wisdom of experts in biotech" he remarked.

Mr. Yarama Ddirpaya representing The Executive Secretary of ARCN at OFAB held in Jalingo

AATF to deploy Newest rice, Bt. Cowpea into Nigeria

In another development, the Regional Director, African Agricultural Technology Foundation (AATF), West Africa, Dr. Kollo Issoufou, has disclosed that AATF is working to deploy Nitrogen-use Efficient, Water-use Efficient and Salt-Tolerant (NEWEST) Rice, Bt. Cowpea and ensure that Nigeria attains food security.

In his remarks at the Jalingo workshop, said AATF as a not-for-profit organization working for farmers and promoting access to agricultural technologies for farmers is deploying both biotechnology and machineries to improve productivity for farmers through collaboration with some research institutes in Nigeria.

He thanked the organizers of the program and wished everyone a successful deliberation.

Dr. Kollo Issoufou, Regional Director, AATF, West Africa.

Ministry of Sci & Tech Dedicated to Improved Technology

Alhaji Hassan Hamman, Taraba State Commissioner of Science and Technology speaking at the OFAB event held in Jalingo, Taraba State

In the same vein, the Representative of the Federal Minister of Science and Technology, Pharm Abayomi Oguntunde has assured the participants of the Ministry's commitment and dedication towards promoting improved technology that will better agricultural productivity in Nigeria. He made the statement while delivering his speech at the Jalingo North-East Zonal 2017 OFAB.

Pharmacist Oguntunde conveyed the greetings of the Hon. Minister, Dr. Ogbonnaya Onu and that of the Permanent Secretary, Mrs Belema Wakama. He thanked the organizers for keying into the economic diversification plan of the Federal Government through Agriculture while recalling that agriculture is not where it should be in Nigeria,

"Towards achievement of the economic growth plan, vision 20:20. The Federal Government will base on agriculture to implement this plan. The key execution strategies include stabilizing the micro economic environment; achieving agricultural productivity and food security; ensuring energy sufficiency, power and petroleum growth; improving transporta infrastructure; driving industrialization, focusing on small and medium scale business", Pharm Oguntunde highlighted.

Concluding his speech, he noted that adopting biotechnology has the potential to diversify the economy and promote food security in Nigeria.

Pharmacist Oguntunde, Director, Bioresource Technology Department, Federal Ministry of Science and Technology.

Taraba State AFAN President Applauds the State Government on improved technologies…

Furthermore, the Representative of the President, All Farmers Association of Taraba State Chapter, Mr. Saad Gabdo applauded the efforts of The State Government in ensuring that improved technologies get to the farmers.

He made the statement during his remarks at the north-east zonal 2017 OFAB Workshop in Jalingo.

"Taraba state farmers are most grateful, dynamic, diverse in farming and welcoming of improved seeds. Thank you for coming to our state and we are hopeful to have improved crops that will better our lives", he added.

A cross section, Members of All Farmers Association, Taraba State chapter at the OFAB event held in Jalingo, Taraba State

TECHNICAL SESSION 2

Prof. Lucy Ogbadu, Director-General/CEO, National Biotechnology Development Agency (NABDA)

Dr. Abdourhamane Issouffou Kollo, Regional Director, African Agricultural Technology Foundation (AATF), Abuja.

Prof. Mary Yeye, Principal Investigator, African Biofortified Sorghum, Department of Plant Science, Institute for Agricultural Research, Ahmadu Bello University

Dr. Rose Gidado, Country Coordinator, Open Forum on Agricultural Biotechnology (OFAB) Nigeria Chapter, presented Dr. Rufus Ebegba's (DG/CEO NBMA) paper

The following papers were presented at this session

1. BIOSAFETY REGULATION IN NIGERIA: DR. RUFUS EBEGBA, DG/CEO, NBMA

The above presentation was done by Dr. Rose Gidado who represented the DG/CEO at this event. According to her, the Biosafety Management Agency was established in 2015 after its bill was signed into law by the former president Goodluck Johnathan. She defined biosafety measures as those checks and practices carried out to ensure that GM crops are safe to consume before commercialization. In addition, she explained the processes involved in approval of a GM crop and assured participants that NBMA is to ensure that modern biotechnology is practised responsibly and safely and that the Agency has enough capacity to carry out this important mandate.

2.THE PROCESS OF DEVELOPING GENETICALLY MODIFIED CROPS-BT. COWPEA CASE STUDY BY DR. ABDOURHAMANE ISSOUFFOU KOLLO, REGIONAL DIRECTOR, AFRICAN AGRICULTURAL TECHNOLOGY FOUNDATION (AATF), ABUJA.

Dr. Abdourhamane in his presentation said GM crops developed to be insect resistant have a big socioeconomic impact for farmers, which include labour reduction, better health, more income and time saving. He added that other aspects include better nutrition for GM crops nutritionally enhanced, crops that are resistant to harsh weather and revitalization of the textile industry for the area of Bt. cotton, which will improve the economy. He also explained that farmers are involved in the multi locational trials of GM crops, which hopefully should be released by 2018.

3. NUTRITIONALLY ENHANCING SORGHUM PRODUCTION AND UTILIZATION USING BIOTECHNOLOGY TECHNIQUE BY PROF. MARY YEYE, PRINCIPAL INVESTIGATOR, AFRICAN BIOFORTIFIED SORGHUM, DEPARTMENT OF PLANT SCIENCE, INSTITUTE FOR AGRICULTURAL RESEARCH, AHMADU BELLO UNIVERSITY.

Prof. Yeye in her presentation highlighted the importance of Sorghum as a staple food consumed in various forms in Nigeria. She indicated that biofortification of Sorghum seeks to enhance the Vitamin A, iron and Zinc content of Sorghum and ensure it gives additional nutrient to consumers. "The goal of ABS project is to increase protein indigestibility resulting from cooking, increase iron and iron bioavailability by 30%. Backcrossing method is applied to ensure the trait is stable enough and biosafety measures also applied," she explained.

DISCUSSIONS

The discussion session was moderated by Mr. Alex Abutu. Questions were raised based on the presentations made as follows:

1. DR. RICHARD ADEOLA, HEAD HORTICULTURE UNIT, COLLEGE OF AGRICULTURE

QUESTION: "Are the breeders not doing enough in the field of agriculture in crop improvements? Is biotechnology working alone or

working alongside other breeding technologies used by breeders?"

ANSWER BY PROF LUCY OGBADU: "Science is dynamic and not static. This means that as new technologies come up, improvements are made in all aspects of life including Agriculture. So many breeding technologies have been applied in the past, but new agricultural challenges require improved approaches. Biotechnology is applied only when the conventional technology fails. It serves as a complement to the existing breeding technologies and does not seek to replace them."

2. GEREGA JACOB, SOUTH EAST TARABA

QUESTION: "How long will the improvement of ABS take before it will be released to farmers and how can students of research institutes become part of this breeding project."

ANSWER BY PROF. MARY YEYE: "The ABS project has been ongoing since 2009. It takes a long time to develop because breeders are backcrossing to ensure that the traits when introgressed is stable. Backcrossing will be done for 6 generations before it will be released. We are not working with the final product at the moment but researching to see how best to make the traits stable. For students to take part, there will be need to modify the curriculum to help students key into the practical aspects of their course work."

3. APOSTLE JOHN, VICE CHAIRMAN TARABA STATE CHRISTIAN ASSOCIATION OF NIGERIA

QUESTION: "How are GM crops made available to farmers, how much will it cost, can it be replanted?"

ANSWER BY PROF. LUCY OGBADU: "The crops will be made available to farmers through the National Agricultural Seed Council and other institutions responsible for commercialization of improved seeds in Nigeria. The cost of the seeds cannot be determined yet until release. Sorghum is an open pollinated crop and there's no need to buy new seedlings each year to replant."

4. HALIYU UMAR, DIRECTOR, S & T MINISTRY, TARABA STATE:

QUESTION: "What are the measures to ensure the biotechnology programme is sustainable."

ANSWER BY PROF. LUCY OGBADU: "This new technology is capital intensive and our government has not been able to invest enough. Measures put in place to sustain biotechnology programmes is the involvement of the Agricultural Research Institutes with the mandate of producing improved crops. We are working to ensure that all stakeholders including the Federal Ministry of Agriculture is involved in this program while also soliciting for continual Government funding for research."

ANSWER BY PROF. LUCY OGBADU: "Biotechnology is not concerned with plants alone. It is applicable to livestock although Nigeria has not done much in this area. Through conventional means, animal breeders are carrying out artificial insemination of cows to improve reproduction. Scientists in NABDA are working on different livestock like cattle, rabbit, grasscutter, and snail."

Members of the high table being invited to take their sit

OFAB secretariat and a cross section of participants

Responses from Interview with Farmers

Sarkin Kona Augustine (The leader of Kona Community), "I am into farming maize, rice, groundnut and beans. I face challenges with yield, but with todays programme, OFAB in Jalingo, we now know that biotechnology can help to address pest, improve nutritional value, and we can get bumper harvest. I am eager to get the seed and I will help to disseminate the information to my community people, I will help to share the seed to my community people when it is available".

A Veterinarian Doctor, Dr. Zubairu Adamu and also a farmer, said "I am into livestock farming and crop farming, I farm maize, beans, sorghum. My farm is about fifteen hectares, I have learnt so much with today's lectures, a lot of pest and farm inputs in our farm. If we are able to control pest, definitely our harvest will be higher. Agricultural biotechnology is a good innovation and we support it. I am eager to lay my hands GM seeds. I make about N10million on my farm annually".

A member of Taraba Women for Change, Engineer Sumayyah Iyan Madu, and a farmer said, "I farm rice, maize, cowpea, soybeans, sorghum. My maize farm is about eleven hectares of land, I make about 280 bags from it during the raining season farming and for rice during the raining season for one hectare I get between 50 to 80bags but for irrigation farming in one hectare I get like 148bags".

In irrigation farming I control my farm, so my attention is always on the farm, using water humps, buying fuel to irrigate the farm, you know rice needs water constantly, the irrigation farming is transplanting, we do nursery bed, after twenty-one days. Irrigation farming is more profitable, as I am talking to you, today I got about 596bags of 100kg, from irrigation farming, I will now face raining season farming, since we are in raining season now, because I use the two."

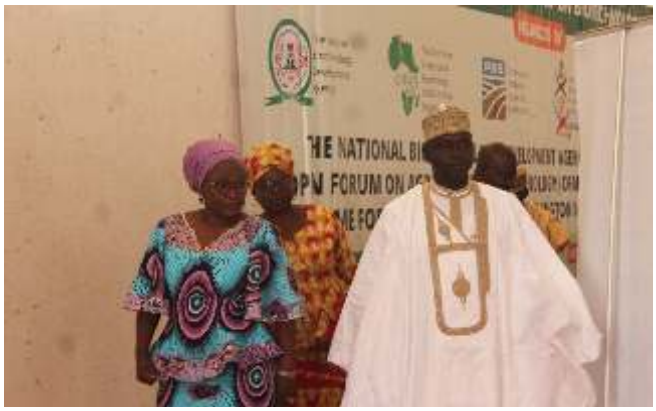
I am a graduate of Agric Engineering, but I make more money in farming than the white-collar job. I produce my seeds myself, I get labourers that help me on my farm. In four months' irrigation farming I make N6 million. The youth should see agriculture as lucrative to go into. The challenge in agriculture is that , it is capital intensive we need financial support from Federal Government. My first output from farm was 79 bags which I started with N20,000 and now I am growing bigger and bigger.

I don't know details about agricultural biotechnology, but I know that what I am using in my farm is technology to improve the yield in my farm. The irrigation machines I am using is biotechnology, I am interested in developing more skills of agricultural biotechnology to help ease our work in the farm".

Taraba State Dance Troupe at the event

Cross section of participants

® the Hon Commissioner, Ministry of science and technology, Alhaji Hassan Hamman exchanging pleasantries with Mr. Yarama Ndirpaya of ARCN



(L) DG NABDA, Prof Lucy J.Ogbadu with (R) the Hon Commissioner, Ministry of science and technology, Alhaji Hassan Hamman.

Report on the 12th Annual General Meeting and Scientific Conference of the Association of Catholic Medical Practitioners of Nigeria

Held From The 6th To 9th July 2017 At Our Lady Holy Rosary Chaplaincy, Ciwa Port Harcourt.

Dignitaries at the High table

This Conference was attended by Dr. Issoufou Kollo Abdourhamane, Regional Director, AATF, West Africa; Dr. Rose M. Gidado, Country Coordinator, OFAB Nigeria; Mr. Umaru Abu, Communications Manager, AATF and Mrs Omozusi Dominica Utaan, Commercial Officer 1, NABDA. The Conference was organized by the Association of the Catholic Medical Practitioner of Nigeria (ACMPN) in collaboration with partners at our Lady of the Holy Rosary Chaplaincy, Catholic Institution of West Africa Port Harcourt. The conference, which was on the theme: Genetically Modified Organisms (GMOs): Harmful, Harmless, or beneficial brought together over 120 Health Practitioners, Catholic Priests and Stakeholders from the Pro and anti-biotechnology organizations in Nigeria. As well as Biosafety officials. The sub themes of the conference were as follows:

- Improving Family Health in Nigeria- Community based strategies
- Doctors in Health insurance and Universal Health Coverage
- Natural Procreative Technology, Bioethical approach to infertility.

Opening Ceremony

At the Opening, Dr. Emmanuel Okechukwu, Chairman of the Association in his welcome remarks said the event was an opportunity to discuss key issues relating to the Catholic Church especially on Health. He added that the event will expose all stakeholders in the health profession who are noble and relevant in the field to understand more on GMOs. He therefore called on participants to pay attention to discussions that will shape their future.

Similarly, the Local Organizing Committee (LoC) Chairman) Dr. M. Okoye, in her address said Nigeria is making efforts to promote the use of Genetically Modified Organisms especially with on-going research on Bt. Cowpea, Rice, Cotton and sorghum. "The stand of the Catholic Church has shown concern in social matters of health, food and social justice right from time. The attitude of the Catholic Church is that of caution in the use of GMOs. The question before us therefore relates to the catholic social teachings", she noted.

Goodwill Messages

1. The President, Nigerian Medical Association, Prof M. Ogirima in his remarks said that based on his knowledge of GMOs and its controversies, he has concluded that where there is poverty, hunger and injustice, there is no choice than to adopt GMOs. However, it must do so safely. "The church should support the efforts to use GM foods to fight hunger and poverty in Nigeria, GM food pose no more harm than conventional foods", he stated.

Speaking further, the President remarked that the theme of the General Meeting is an indication that issues surrounding health in Nigeria is taken seriously. Prof Ogirima stated that the Nigerian Medical Association is advocating the need to expand the scope of health and therefore called on the government to develop their health insurance schemes to support the health sector in Nigeria.

2. Meanwhile, the President of the Medical Women Association of Nigeria Rivers State Branch, Dr. Tabansi in her remarks said the association seeks to promote the health of women and children in Nigeria. She added that the theme for this year's conference is apt in this time of food dumping and expressed hope that proceedings of the conference will be educative and impactful.

3. While the Representative of the International Fraternity of Catholic Federations, Dr, Williams, in her goodwill message conveyed greetings from the Association and remarked that in this era of increasing circularization, Africa should not be isolated from

development as the role of every Catholic Doctor is the respect for value of life. She concluded by saying that the Catholic Church must be aware of issues around GMOs and should take the best decisions to safeguard human health and the environment.

Keynote Address

The Keynote Address was delivered by Dr. Camillius Etokudoh, Catholic Bishop of Port Harcourt. According to him, the theme of the conference is in the face of conflicting opinions that are brandished all around GMOs, adding that it will serve the Catholic Medical Practitioners who are professionals in their own fields decide for or against GMOs, such a theme for the conference is entirely beneficial to the continuous debate

The Bishop further stated that most times, it is argued that the overarching need to feed so many people around the world is the major reason that justifies the use of GMOs. This is because genetically modified seeds enable us to produce more foods that will meet the needs of both the rich and poor. "A particular GMO seed will not, as a matter of fact, prove entirely harmful. However, unless we are certain of this fact, in general, until we can be certain that we are genuinely entitled, as stewards of the natural world, into, and modify the fundamental structures of things, we have an obligation to extremely caution and to refrain from activities that will make us destroy the natural state of things", he declared.

Dr. Camillus further opined that the application of technology without adequate assurance of safety is itself immoral. What would constitute satisfactory guarantee in a matter of delicate, multifaceted, and grave as it is probably such that it could never, in principle, be attained, and so the legitimacy of using GMO products would remain perpetually questionable. To question its use does not nullify its potential benefits.

Concluding his remarks, Dr. Camillus reiterated that the Catholic Church's position is a plea for caution, for serious investigation, for clear thinking in the application of any technology. He therefore asked for a critical approach towards discussion on GMOs even as the economics of it is as important as its safety.

Technical Session

The Technical Session which was chaired by Dr. E. A Bazuaye, featured presentations from the OFAB Nigeria Coordinator, Dr. Rose Gidado and Dr. Nimmo Bassey, Health of Mother Earth Foundation. Commencing the plenary session, the Chairman applauded the organizers of the Conference specially because it sought to address the issues of GMOs.

Dr. Rose Gidado in her presentation highlighted that NABDA has the mandate to promote, coordinate, deploy, domesticate, carry our research and development, formulate policy on biotechnology and create awareness on the potentials of the technology in Nigeria. She also defined Food security as the availability/affordability of quality food in the right amount to the majority of the population and enumerated the threats to food security to include population rise, the declining age of farmers, insect and pest infestation, climate change, drought, flood, salinity, Weediness and many other factors. "Therefore, for Nigeria to attain food security, there is need to embrace all existing agricultural technologies that seek to promote yield, reduce climate change effect and maximize productivity", she added. GM technology is one of the beneficial agricultural technologies, which have impacted on farmers in other countries where the technology is commercialized. Its ultimate aim is to improve the ability of seeds to resist insect/pest attacks, harsh weather conditions to bring about food security, improved and sustainable environment and more income for farmers.

Finally, Dr. Gidado posited that the importance of the GM technology in agriculture helps breeders to proffer solutions which conventional breeding cannot solve. On-going research in Nigeria so far on Bt. cowpea, Bt. cotton, nutritionally enhanced sorghum and nitrogen use efficient, water use efficient and salt tolerant rice have been successful. However, the research is regulated by the Biosafety Management Agency, she emphasized.

Rose made the following recommendations:

I. The arguments about the safety and health concerns around GM products are unfounded because only healthy dosages of chemicals and pesticides are used in genetic modification.

II. The fears around glyphosate being carcinogenic have been allayed by the European Food Security Authority (EFSA) when in November, 2015 it published the EU's peer review of the active substance, glyphosate.

III. Key into GM microorganisms, they are replacing chemical, synthetic methods to produce vitamins, flavors, enzymes, and other food additives.

IV. They are easy to cultivate, don't require harsh chemicals, are environmentally friendly, and use less energy

V. Key into safe 'GMO' programmes that promotes economy, Example. Farming of E. Coli, Production and Sale of Insulin.

VI. Global Insulin Market Size is expected to reach to reach $39.13 Billion By 2020 growing at a compound annual growth rate (CAGR) of 8.1%. (markets and markets.com) and $53.04 USD by 2022 (Grand View Research, Inc, 2015).

VII. Global market for Rapid Medical Diagnostic Kits, estimated at US$19.4 billion in 2014, forecast at US$20.4 billion in 2015 and further expected to maintain a CAGR of 5.7% between 2014 and 2020 to reach a projected US$27 billion by 2020.

She concluded with the following:

I. Crop biotechnology is the most advanced and powerful tool available to solve the food crisis in Africa, including Nigeria. It works.

II. The Confined trials in Nigeria of

PBR-Cowpea, the WEMA trials in East Africa have shown that yield can be increased in the face of adversity-insect attack or drought and can be highly profitable to farmers.

III. The varieties have no deleterious effect on the environment; and by reducing the number of pesticide sprays the environment is safeguarded.

IV. The history of GM crops in the world has shown that they can be safer than conventional crop (Bt.-maize is less contaminated by aflatoxin than conventional maize) and has no relation to cancer.

In another development, while presenting his argument against GM crops, the Founder of the Health of Mother Earth foundation, Nimmo Bassey said GM crops are a plot by multinationals to control the seed systems. He expressed concerns that GM seeds look alike with conventional seeds, which is worrisome without labelling. He also called for the repeal of the National Biosafety Management Act and claimed they have a link to multinationals and NABDA. In conclusion, Nimmo said Nigeria does not have the adequate capacity to do GM research; instead, the local seed systems should be encouraged.

While the DG/CEO, the National Biosafety Management Agency(NBMA), who was represented by Abisabo Adamu gave a presentation on Biosafety Regulation in Nigeria. According to him, GMO is a very controversial topic but the concerns raised by the public should be backed by scientific evidence and not by sentiments. He said NBMA was established in 2015 to provide a regulatory framework and institutional mechanism for GMOs adoption in Nigeria. He outlined the roles of the Agency as stated in the NBMA Act and assured participants that no GM crop will be released in Nigeria without going through adequate checks and control.

Questions/Discussions

1. Since it took 40 years to discover that IVF has health implications on a baby. What are the long-term effects of GM crops on humans?

2. Since the GM foods undergo varieties of test, how can we as humans try to identify these foods, which has also affected our natural food or production?

3. Why Nigerians having the best Natural products indulge in such GM food. We are aware that cancer is unrestricted multiplication of cells and GMOs lead to cell division. It means GMOs increase the risks of cancer.

4. At what level do we restore the large-scale loss of biodiversity

5. The issue of Epi-genes was also raise.

6. Can GM seeds be re-planted?

Group Photograph at the 12th Annual General Meeting and Scientific Conference of the Association of Catholic Medical Practitioners of Nigeria

In response to these questions, Dr. Kollo Issoufou from the African Agricultural Technology Foundation (AATF) said Biological materials existed before the time of Genetic modification. Any GM crop before release goes through a variety of tests for safety and effect on the environment before commercialization. Since 1975 biologists learnt how to transfer genes from one organism to another. This amounted for the breeding programmes and the knowledge of biotechnology. The issue of biotechnology is same with all other technologies applied worldwide. Therefore, there is no established health issue on the use of the crops with over 20 years of commercialization globally. Speaking further, Kollo said Epi-genes are known long time ago to be genes which modify other genes. For Example Bt. cowpea behaved in line with Mendelian segregation laws. All the genes of insert are studied for a long time before used for modification. The gene sequence also known. You can grow the same varieties of GM Seeds again depending on the source of the parent plant and so many scientific organizations have researched and found no evidence linking GM crops to cancer.

Dr. Gidado in responding to some of the questions raised at the meeting said just like IVF babies whose conception take place outside the womb just to make barren women happy are normal human beings like us, not synthetic or artificial, so also genetically modified crops; GM crops are natural and safe.

On the issue of replanting, Dr. Gidado said GM seeds can of course be replanted except if the parent of seed is hybrid. Hybrids are developed for yield and the seeds can't be replanted. Capping up the discussion session, Dr. Gidado in every technological development, regulation is the key, with regulation, there is safety. She urged all participants to call on the government to adequately equipped the National Biosafety Agency (NBMA) saddled with the responsibility of ensuring safety of this technology with the state-of-the-art facility for efficiency, effectiveness and transparency.

Report on the 6th Annual Scientific Conference and General Meeting of the Epidemiological Society of Nigeria (EPISON)

Held At Grace Point Hotel, Wuse Zone 6 Abuja On Thursday, 13th July 2017.

Group photograph of participants at the 6th Annual Epidemiological Society of Nigeria Conference

The 6th Annual Epidemiological Society of Nigeria Conference was held from Thursday, 13th July to Friday 14th July 2017 at the Grace Point Hotel, Abuja. In attendance were 57 participants from different parts of the country including Health Professionals and invited Guests from the National Biotechnology Development Agency (NABDA), the Federal Road Maintenance Agency (FERMA) the Federal Ministry of Health, Vice Chairman House Committee on Health, the African Agricultural Technology Foundation (AATF), the Public Health sector, Federal Capital Territory and the Open Forum on Agricultural Biotechnology (OFAB) Nigeria.

Opening Ceremony

The event started at 9.am with welcome remarks by the President, EPISON, Prof A. I. Zoakah. According to him, the theme of the conference, Epidemiological Transition, Implication for Public Health Intervention and Research is not only a topical issue but possesses the challenges that the Epidemiologists in Nigeria face daily in programme implementation and research. He added that the sub theme, focused on 'the Epidemiology of GMOs' is very controversial yet vital topic, which the participants would at the end of the Conference gain more knowledge on. He therefore encouraged all members and participants to actively participate in all the sessions and use the opportunity offered by the conference to network with one another.

Furthermore, Prof. Zoakah acknowledged the partner Agencies who contributed to the success of the conference. The Nigerian Centre for Disease Control, the National Primary Health Care Development Agency, the National Biotechnology Development Agency and the Open Forum on Agricultural Biotechnology (OFAB) in Africa, Nigerian Chapter were of special mention.

Goodwill Messages

Delegates and Representatives of partner agencies gave their goodwill messages and they included the Chairman, Local Organizing Committee of the Conference, Dr. Terfa Simon Kene; the DG/CEO, Federal Road Maintenance Agency; Secretary, Health and Human Services Secretariat, Mrs. Alice Odey-Achu and Guest Speaker, Dr. Chikwe Iheakweazu.

The Representative of the DG/CEO NABDA, Dr. Rose M. Gidado who is the OFAB Nigeria Coordinator in her remarks conveyed the greetings of the DG/CEO, NABDA, Prof. Lucy Ogbadu who was unavoidably absent. In her goodwill message, she reiterated the benefits Nigeria stands to gain from the use of genetically modified crops which include weed control, insect and pest control, drought tolerance, resistance to harsh weather conditions as a result of global warming all-together will result to high productivity and increase in profit margin. These will go a long way in empowering farmers and improving their livelihood.

Speaking further, she said her role at

EPISON president awards DG NABDA for excellence in biotechnology awareness. The award was received by Dr. Rose Gidado on behalf of Prof. Lucy Ogbadu, DG/CEO NABDA

the conference was to correct most of the misconceptions people have about Genetically Modified Crops. "This technology is being misrepresented, mystified, misconstrued, people are misinformed causing fears, panic in them. But one thing I want to remind you about this is that it is a science and science is a body of knowledge, a process, a collection of facts, it is evidence-based and a driver of change. We cannot do without it in this modern day. The key thing is regulation. With regulation, there is safety in all scientific ventures" she added. Dr. Gidado emphasized that her presentation was meant to highlight the studies carried out on GM crops globally as well as research level in Nigeria. She assured Members of the Society of NABDA's continual support towards subsequent conference and wished them a successful deliberation.

In Conclusion, the Chairman, House Committee on Health made an Opening remark after which the declared the event Open.

Plenary Session

The Plenary Session was left only for OFAB presentation with the topic: 'The Epidemiology of GMOs' by Dr. Rose Gidado. According to her presentation, Epidemiology is a branch of medical science dealing with the transmission and control of disease whereas GMOs are plants or animals whose genetic makeup have been improved for a desired product. She noted that there is no much relationship between the two since no GM crop have been found to be disease causing.

However, she took time to explain the safety measures put in place and tests carried out before the release of any GM crop. Her presentation further highlighted the differences between GM and conventional crops as well as its history, benefits, examples, safety as well as global rate of adoption.

"Genetic Modification technology is the fastest adopted technology in

the world with 185.1 million Hectares planted by 18 million farmers

in 26 countries in 2016", she emphasized.

Dr. Gidado also explained the rationale behind the use of GM crops as well as the risk assessments including safety evaluations done on the crops before release. "The safety assessments are carried out on case-by-case basis while environmental assessments are done to access the crops potential for weediness/weed invasiveness; gene flow to related species; plant pest properties on transgenic crops; impact on non-target organisms and impact on biodiversity.

Rose declared that globally, the international scientific community have not found any negative effect of consuming GMOs. She called on participants to view GMOs based on the scientific evidence around it and join the global conversation to promote access to improved technologies for farmers. In ending her presentation, she gave the following recommendation and conclusion.

Recommendations

I. Nutritionist to educate their patients, the medical community, and the public on the potentials of GM crops when possible and provide educational materials correcting the misconceptions people have.

ii. The medical community, and the independent scientific community to gather case studies potentially related to GM food consumption and health effects, begin epidemiological research to investigate the role of GM foods on human health, and conduct safe methods of determining the effect of GM foods on human health.

iii. For a moratorium on GM food, implementation of immediate long term independent safety testing, labeling of GM foods, which is necessary for the health and safety of consumers.

Conclusion

I. Any new technology has its set of advantages and disadvantages. However you cannot condemn a beneficial technology because of the possible misuse. The simple solution is to use the technology with great caution.

ii. They are a topic of much deliberation and tension; very prevalent in some parts of the world and banned in others

iii. Ultimately, GMO's are still a relatively new technology in Nigeria. Developed countries have gone ahead to adopt CSIPR gene editing technology for crop improvement. 20 years of consumption have not revealed any harmful effects on humans.

Questions/Discussions

A panel discussion chaired by Prof.

Dr. A.I.Kollo responding to question raised on Glyphosate during the Discussions session

Dr. Francis Onyekachi, Project Officer, African Agricultural Technology Foundation (AATF), Abuja throwing more light on issues raised.

Lawrence Ogbonnaya from Ebonyi State University followed the plenary session. Members of the panel were Dr. Rose Gidado, OFAB, Dr. Abdourhanane Issoufou Kollo and Mr. Francis Onyekachi from the African Agricultural Technology Foundation (AATF). Questions were raised by participants and answered below:

1. Prof. A. I Zookah, President EPISON: Have any research been conducted on GMOs in relation to the human interface in order to really find out the Epidemiology of these crops?

Answer by Dr. Kollo: "Biotechnology started around 1974 when first transformed bacteria with foreign gene was discovered. The National Academy of Sciences brought up guidelines on biosafety with the use of bacteria's. That is how guidelines for safety had evolved up till the time Cartegena Protocol on Biosafety was adopted by member countries. Biotechnology is like any other technology with bright and bad side. We do not have to stop our progress because of the disadvantages of a technology, which obviously under-weighs its advantages. Nigeria is beginning to invest in scientific studies and research on these crops to test its efficacy in the Nigerian environment and very soon, we will reap its benefits like in other developed countries".

2. Prof E. E. Enanem, Prof. of Epidemiology, University of Lagos: Are there international instruments to prevent individuals from misusing the technology? Is 21 years really enough to study the effects of these products? Are there Gm crops in Nigeria? Are you working in close collaboration with IITA?

Answer by Dr. Rose: "Yes, there are international instruments and guidelines set up to prevent individuals from misusing the technology. In Nigeria for example, there is a fine and jail term stated in the Biosafety Act for any individual who practices the technology without going through the procedures. Research is an ongoing process and the safety of GM crops continues to be tested. However, 21 years of consumption proves it is safe and a tool that will help promote food security. NABDA has been collaborating with IITA and doing a lot of research together".

3. Prof Micheal C. Asuzu from University of Ibadan:

Prof. Azusu thanked the organizers and Dr. Rose Gidado for an elaborate presentation. He however noted that there is need to take possession of the science of Biotechnology in Nigeria. He called for caution among Nigerian scientists and for the Biosafety management Agency to be fully equipped to regulate the use of GM crops in Nigeria. He also emphasized that Precautionary principles be well considered to make sense of any technology.

4. Dr. Ibrahim Maimagani, Registrar Department of Community Medicine, University of Jos: Is 21 years enough to study the effects of GMOs on gene mutation? What is the assurance that multinationals will not enslave farmers with these seeds?

Answer by Mr. Francis: Although there are legitimate concerns about health, safety, ethics and morality around GM crops, we have to note that these crops only seek to solve agricultural challenges. There is no doubt that the problems of pest and diseases, climatic variability, soil fertility are real. Precautionary principle is very important and this is why there is a mechanism in place to regulate. There is local research in Nigeria on the safety of these crops and Nigerian scientists are gathering data and result from their research too. Social justice/ impact of multinationals is also very important. Many of the GM crops we are developing have social justice taken into consideration. For Example, Maruca damages the yield of Beans by about 80% and Pod Borer resistant Cowpea is the only present solution to this damage. It is therefore a social justice issue to make these improved crops available for farmers.

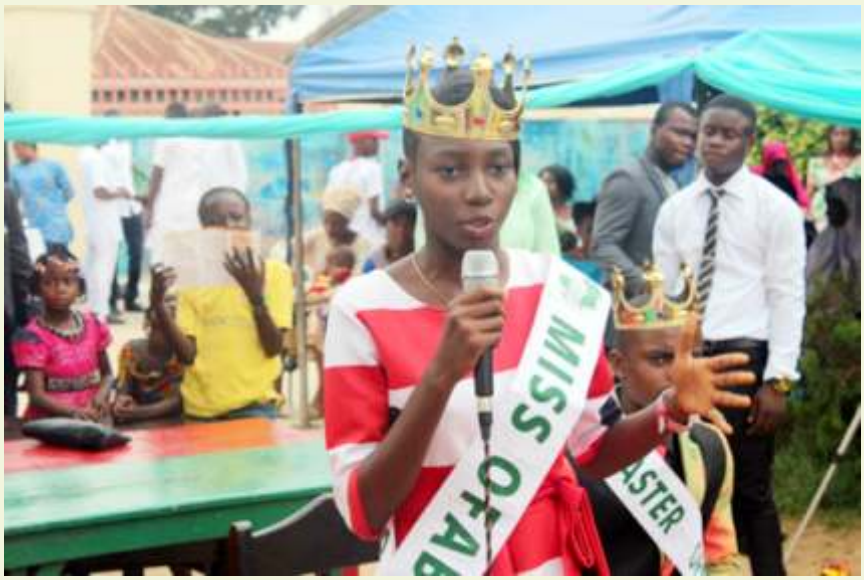
In Conclusion, participants made these 2 recommendations:

- There is need for a constructive stakeholder engagement in Nigeria. Promoters need to engage to douse fears among the public as many benefits can be accrued from the use of the technology.
- For the local research on GM crops in Nigeria, all stakeholders should be brought on board to participate and understand the processes involved.

At the end of this session, the EPISON President awarded the DG/CEO NABDA, Prof. Lucy Ogbadu for her meritorious service and contribution towards promoting food security in Nigeria. Dr. Gidado received this award on her behalf.

OFAB Goes to School

A Report on the 16th Annual Graduation/Prize Giving Ceremony of Highgrade International School, Maraba, Nasarawa State by OFAB Nigeria on 28th of July 2017



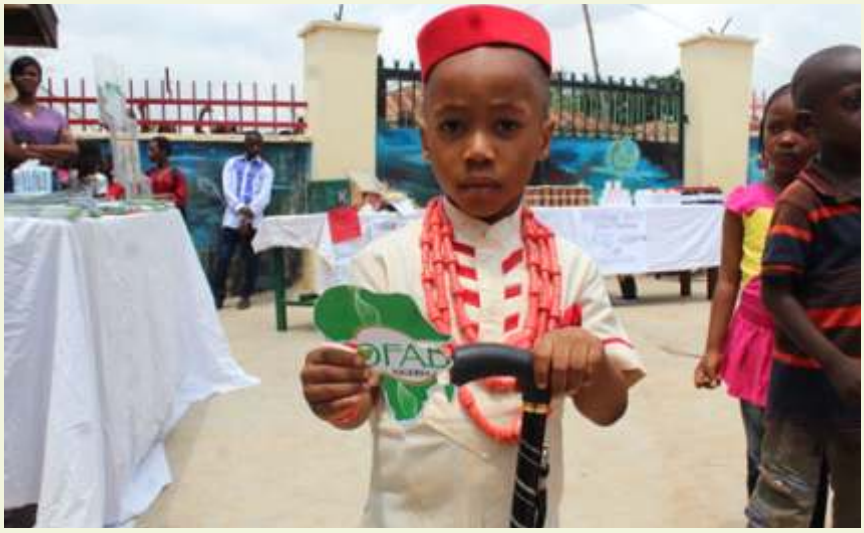
Miss OFAB 2017, Mary Etuk Speaking on the Potential of Biotechnology at the Event

One of the objectives of OFAB Nigeria is to ensure proper dissemination of information on Biotechnology throughout the Federation. In order to achieve this, children are priority targets because they can be guided on the career choices to make. It is on this premise that OFAB NIGERIA collaborated with the Nigerian Television Authority (NTA) to celebrate Nigerian children during the Children's Day Celebration, which held at the media house premises on May 26th 2017.

Over 1000 Children were present during this event. An Inter-school quiz competition centred on Biotechnology awareness among children in schools was part of the celebration and two Students of Highgrade International School, Mararaba emerged winners of the competition after which they were crowned Master and Miss OFAB Nigeria 2017.

On the 28th of July 2018, the school held its 16th annual graduation ceremony and the OFAB Nigeria Coordinator was invited to be the Guest Lecturer for the ceremony as well as to officially unveil the Master and Miss OFAB 2017. During the graduation ceremony, the Miss and Master (Mary Etuk and Francis Ubah) OFAB team addressed the students and parents on the various ways Biotechnology can help improve the living standard of the populace through Agriculture, Health and other various sectors that Biotechnology can greatly impact. They spoke eloquently and passionately about the technology. The Country Coordinator Dr. Rose M. Gidado in her remarks expressed how delighted she was with the school, particularly how greatly they have helped in creating a positive impact on their students. She also expressed her joy with the warm welcome given to OFAB in the school. She further stated that OFAB will continue to work with the school and promote awareness of biotechnology development.

In addition, Dr. Gidado explained that biotechnology aims at combating challenges facing farmers, such as insect and pest manifestation, drought, flood and other climate change issues, which discourage



Little Master OFAB at the Graduation Event

Dr. Gidado distributing prizes to pupils at the Graduation Ceremony

The Proprietor of the High Grade International School, Mr. Charles Umekwe addressing the Pupils during the Graduation Ceremony.

them and in turn affect their productivity. It goes down to adversely affect the economy and food insecurity may be experienced. She also elucidated the processes by which scientists produce genetically modified crops and how this can help with food security in the country and improve seedlings, which are resistance to pests and diseases, and shorter maturity period.

In Conclusion, she urged the students to embrace science, and encouraged the outgoing senior secondary students to choose Biotechnology in the University because it will give them a broader scope for research and opportunity to develop ways on how to improve on existing innovations especially in Agriculture. Finally, Dr. Rose charged the students and parents to keep talking science wherever they go as it shapes our world and has the potentials to bring about food security in Nigeria.

In his response, the Proprietor of Highgrade International School, Mr Charles Umekwe thanked the OFAB Nigeria Coordinator, Dr. Rose Gidado for her efforts in reaching out to the students and supporting the children through the medium used. He said the school will continue to partner OFAB in creating awareness about the technology so that Nigeria can benefit from it, especially at this time of economic diversification.

"We are happy to be associated with the Open Forum on Agriculture and Biotechnology (OFAB) as an organization that believe in agriculture and development for the benefit of mankind. Thank you for crowning our students Miss and Master OFAB 2017, we are grateful, may God continue to bless your organization. We shall be ever willing to partner with you in any area you may need our partnership". He acknowledged

The event was informative and it gave parents and students a broad understanding of what the awareness is all about. Students and parents were empowered with more information on biotechnology research and activities in Nigeria. Most of them asked questions on how they can be part of OFAB and contribute towards advocating for access to Biotechnology for farmers in Nigeria.

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