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# Agricultural Biotechnology Annual

# Nigeria's Agricultural Biotechnology Update (2013)

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**Report Highlights:**

The Nigeria Senate passed the Bio-safety Bill into law on June 1, 2011. The law leans heavily on the precautionary approach and provides details for managing and controlling agricultural biotechnology in Nigeria—requiring certification and mandatory labeling for imports of all products of biotechnology. However, Nigeria's President Goodluck Jonathan has not signed the bill, keeping the bill subject to continued exhaustive debate addressing issues regarding the adoption of the new technology. As part of the adoption process, confined field trials are being conducted in the country for transgenic cow pea, sorghum and cassava varieties. Meanwhile, many Nigerian farmers are reported to have begun to plant biotech seeds smuggled into the country. Many imported processed foods and food ingredients consumed in the country are also believed to be products of agricultural biotechnology.

**Section I. Executive Summary:**

Nigeria, Africa's most populous nation (167 million), is a food deficit country. Formally a net food exporter, Nigeria's subsistence agriculture can no longer supply the needs of its growing population. According to trade sources, Nigeria imported more than $7 billion worth of food products and agricultural commodities in 2012. Nigeria is largely a bulk commodity market and imports wheat, soybean products, tallow, rice and high value products. In CY 2012, U.S. agricultural exports to Nigeria were over $1.0 billion, primarily wheat.

Nigeria's bio-safety bill, in development for nearly 15 years, was finally approved into law by the Senate of Nigeria's 6th National Assembly in June 2011. The bill defines the handling, transfer and use of modern agricultural biotechnology and products to ensure safety for the environment and for human health. It also provides for safe application of modern biotechnology. It also states offences and penalties for violation of the act and contains powers to authorize release of genetically engineered (GE) organisms and practice of modern biotechnology activities. It further confers the power to carry out risk assessment/management before the release, handling and use of GE organisms, and covers all Living Modified Organisms (LMOs) and products like food, feed, processing as well as socio-economic consideration in risk assessment.

However, Nigeria's President has still not signed the bill, the final step for it to become law. Making the bill operational will pave the way for biotech products to be commercialized. Nigeria's President raised some issues with the bill but the country's Ministers of Agriculture, Environment and Science/Technology addressed all points and it is expected that the bill will eventually be signed into law.

In anticipation of the signing of the bill into law, the Biosafety Office of the Federal Ministry of Environment commenced drafting some of the regulations for effective implementation. Although the law leans heavily on the precautionary principle, it is seen as a major milestone in ensuring the safe application of biotechnology.

Specifically, Nigerians expect the application of the technology to serve as a tool to achieve food security. The enactment of the law will send a very clear message to the rest of Africa and indeed the world that the most populated country on the continent is prepared to receive, regulate and, most importantly, commercialize biotechnology products.

The biosafety law will provide the legal framework for Nigerian scientists who have done much research to move forward from field trials into commercial testing phases for eventual deployment to farmers.

The impending biosafety law calls for the establishment of the Biosafety Department under the National Biodiversity Management Agency, a new agency to be created to provide oversight for biotechnology's use in Nigeria. The Bio-safety Department is expected to be the focal point and authority on biosafety in the country.

According to the federal government of Nigeria, the law aims to:

- Define modules of practice of modern biotechnology and the handling of its products to ensure safety to the environment and to human health;

- Guide different segments of society in contributing to safe application of modern biotechnology;
- Recognize the complex issues to be addressed by central authorities in the judicious application of modern biotechnology;
- Ensure that modern biotechnology activities and their products are safe for the environment and to human health;
- Base the deliberate release of GE organisms on advance informed agreement;
- Define responsibilities among designated bodies/institutions;
- Confer powers to authorize release of GE organisms and practice of modern biotechnology activities;
- Confers powers to carry out risk assessment/management;
- Define offences and penalty for violation of the act;
- Cover all LMOs, products food/feed and processing;
- Cover socio-economic consideration in risk assessment and labeling of all GE products;

The bio-safety law also defines penalties for not complying with its regulations. Failure to obtain approval or proper permits before importing or releasing GE organisms into the environment carry the following stated penalties:

- Individuals can be fined 2.5 million Naira (about $15,000) or imprisonment for a period not less than 5 years or both;
- Corporations would pay a fine of not less than 5 million Naira (about $30,000) and the directors or officers of the body shall each be liable to a fine not less than 2.5 million Naira (about $15,000) or imprisonment for a term not less than 5 years or to both such find and imprisonment;
- False information results in the same penalty as failure to obtain approval;
- Obstruction results in a 2.5 million Naira (about $16,000) fine or imprisonment for not less than 3 years or both;

The law contains some clauses that could negatively impact the importation of products derived through agricultural biotechnology. Section 9 (functions of the national bio-safety committee) mandates the committee to assess and recommend approval of applications submitted for the import/export, transfer, and transit of GE products. In addition, Part V (Notification and Authorization) clearly states that importation/exportation and movement of GE products will require prior approval from an independent biosafety agency (when established) or the Ministry of Environment.

The Open Forum on Agricultural Biotechnology in Africa (OFAB) is Africa's platform that brings together stakeholders in biotechnology and enables interactions between scientists, journalists, the civil society, industrialists, lawmakers and policy makers. In Nigeria, it is a monthly lunch meeting that provides an opportunity for key stakeholders to know one another, share knowledge and experiences, make new contacts and explore new avenues of bringing the benefits of biotechnology to the African agricultural sector (http://www.ofabafrica.org/about-ofabafrica).

At Nigeria's June Edition of OFAB, biotechnology stakeholders including law makers opposed the continued delay in legitimizing biotechnology in Nigeria, describing it as impacting negatively the expected success of the much publicized agricultural transformation agenda of the present Nigerian

administration. According to these stakeholders, "the domestication of biotechnology in Nigeria is a welcome development in view of the vital role it can play in the socio-economic development of the nation, including environment and agriculture, as evidenced from development in other climes the world over."

According to some lawmakers among these stakeholders, "the President seems to have veto the bill and the country's National Assembly plan to bring it back to override the President's veto."

**Section II. Plant Biotechnology Trade and Production:**

**A. Commercial Production of Biotechnology Crops**

Nigeria does not produce any biotechnology crops commercially. At a recent meeting organized by NABDA, key speakers recommended that Nigeria should commence the commercialization of GE crops starting with crops with high industrial uses.

Professor Ita Ewa, Nigeria's Minister of Science and Technology announced that GE products will become legal and available for commercialization in Nigeria before 2015. He disclosed this at the launching of International Service for the Acquisition of Agric-biotech Application (ISAAA) in Abuja, Nigeria that Nigeria's "President would sign the biotech bill soon and Nigeria would join four other African countries including South Africa, Burkina Faso, Egypt and Sudan already benefiting from planting GM crops by commercializing biotech/GM crops in 2015." According to him, commercialization would immediately follow after the ongoing field trials across the country."

**B. Biotechnology Research Efforts**

Capacity exists at the International Institute for Tropical Agriculture (IITA), and to some extent at the Government of Nigeria (GON)'s Sheda Science and Technology Complex (SHESTCO), to conduct and apply basic biotechnology research. Nigerian scientists using the facilities at the IITA have made significant progress in the transformation of a local tomato variety. The institute is doing preliminary work on bio-engineered cowpea.

According to sources, the Bill & Melinda Gates Foundation is proposing to establish standard biotechnology laboratory in Nigeria, to assist with building human capacity in national biotechnology programs in Nigeria and all of Africa. This is essential as new sets of biotechnology tools are being employed worldwide to improve crops and they are very complex. There are also a number of crops developed across the world using biotechnology tools and undergoing testing in various African countries including Nigeria.

With the laboratory, Nigeria will become a center with biotechnological facilities for building human capacity that can make independent decisions on how to use biotechnology tools within the country's national regulatory system. The crops being focused on for Nigeria include soybeans, rice, corn and any crop of national interest. Please visit the following website for details: (http://www.merid.org/en/Content/News_Services/Food_Security_and_AgBiotech_News/Articles/2013/Jul/12/nigeria.aspx).

**C. Biotechnology Crops under Development**

Field trials of the Bio-cassava Plus or Vitamin A cassava (developed in the United States by the Plant

Danforth Center, Missouri) was formally launched in Nigeria on July 31 under the Agricultural Transformation Agenda of the federal government by Nigeria's Agriculture Minister Dr. Akin Adesina (For details please visit: http://www.harvestplus.org/content/vitamin-cassava-dissemination-officially-launched-nigeria).

The cowpea was developed in Australia but in all cases with significant participation of Nigerian scientists. With transgenic insect-resistant cotton now in commercial production in Burkina Faso, Nigerian farmers have indicated strong interest in commercial production of GE crops, such as bioengineered cotton and the drought-tolerant corn (WEMA project).

**D. Imports of Biotechnology Crops/Products**

Nigeria's Minister of Agriculture, Dr. Akinwunmi Adesina, had earlier this year announced that Syngenta, Monsanto Company and DuPont Company would be setting up office in Nigeria by June 2013. These are global biotechnology giants and holders of most transgenic crops 'patents.

At present, agricultural products such as soybeans, soybean meal, soybean oil, and corn are freely imported from the U.S., EU, Brazil and Argentina. Just as it is with processed food products, more food processing ingredients and intermediate products shipped into Nigeria are also products of biotechnology.

**E. Food Aid**
Nigeria is not a recipient of food aid.

**F. Production of Biotechnology Crops Developed Outside the United States**
At present, Nigeria does not produce biotechnology crops.

**Section III. Plant Biotechnology Policy:**

**A. Regulatory Framework for Agricultural Biotechnology**
The GON has established institutions and enacted policies and laws that could stimulate agricultural biotechnology in the country despite lack of generally scientific acceptance regarding the risk of GM crops and products as well the absence biosafety law.

**i). Responsible institutions involved in agricultural biotechnology in Nigeria**:

**The Federal Ministry of Environment** is the National Focal Point and the competent Authority for biosafety in Nigeria. It will be the regulating body for modern biotechnology activities e.g. provision of the bio- safety/regulation requirements for bringing into the country GE crops for testing and release when the bill is signed by the President to become law. This Ministry is the GON's liaison with the Secretariat of the Convention on Biological Diversity for administrative functions required under the Cartagena Protocol on Biosafety. The Federal Ministry of Environment is also proposing the establishment of an independent biosafety agency in the biosafety bill to become the regulating body for all biotechnology activities including responsibility for all correspondences with importers, exporters and applicants on movement of products of modern biotechnology.

**The Federal Ministry of Agriculture** is in charge of formulating agricultural policy as it relates to biotechnology, promoting and facilitating agricultural activities, implementation of the policies and programs of agriculture. It houses all agricultural research institutes in the country.

**National Biotechnology Development Agency (NABDA)** was established in 2001 in the Ministry of Science and Technology with the mandate for formulating biotechnology policy in Nigeria, acquiring, deploying, promoting and facilitating biotech activities for indigenous and self-reliant national growth. The agency is active in creating awareness for products of biotechnology. NBDA conducts regular workshops for the major stakeholders in biotechnology.

GON's **Sheda Science and Technology Complex (SHESTCO)** is a center for research and training in the area of modern biotechnology. It has the mandate to domesticate technologies for the application of modern biotechnology in health, agriculture, and environment.

**Universities** are also involved in research and development aspects of agricultural biotechnology. Most of them have Institutional Biosafety Committees.

**ii). Role and Membership of the National Biosafety Committee (NBC)**

The NBC serves as the Competent National Authority for biosafety in Nigeria. The NBC is responsible for the safe management of biotechnology activities, including research, development, introduction and the use of LMOs. The Committee has 16 members drawn from the Ministries of Agriculture, Science & Technology, Environment, Commerce, Education, Health (NAFDAC), Industry, Foreign Affairs, Internal Affairs (Nigerian Customs Service), Justice, and NACCIMA/Organized Private Sector. The NBC will also include a Biologist, a Physical Scientist, a Social Scientist and a Representative of NGOs distinguished in environmental/conservation matters. The NBC is required to review all applications for the release of products of bioengineering and make recommendations to the Minister of Environment on whether or not to allow such products. The NBC oversees the implementation of the National Biotechnology Program, consistent with the Bio-safety Law.

The NBC has also established National Biosafety Technical Sub-committees (NBTS) to focus on sectoral interests such as agriculture, health, industry and the environment. The sub-committees review proposals for research and recommend the conditions under which experiments should be conducted. They are to provide technical advice to the NBC and contribute to its functions in relation to contained use, field trials, release and placement on the market.

Presently, all applications for import, field trials, transit and contained use must be routed through the biosafety section of the Federal Ministry of Environment. The NBC will meet and direct the relevant NBTS to carry out risk assessment and ensure participation of all relevant stakeholders. Findings of the NBTS are submitted to the NBC and then the decision is conveyed to the applicant by the Federal Ministry of Environment. A license to carry out events is also issued by the ministry.

**iii). Political factors**

The Nigerian government appreciates the potential of biotechnology to improve agricultural productivity. The national biotechnology policy document states that the GON "supports biotechnology because of its immense potential to more rapidly contribute to sustainable food

security and economic growth." Government's support for the development of the technology is anchored on the country's need to feed the teeming population with the challenges of global warming and the attendant climate change. The Federal Ministry of Agriculture (Nigeria's USDA) also supports the application of Biotechnology in Agriculture. This is demonstrated by the action of the Ministry in setting up a Study Group to develop a strategy for the application of biotechnology in Agriculture. The Director General of NABDA is the chairman of the committee.

**B. Approval of Biotechnology Crops**

Now that the biosafety law has been enacted by the National Assembly, the Federal Ministry of Environment, which houses the secretariat of the National Biosafety Committee, has commenced drafting of the operational guidelines.

**C. Field Testing**

With the approval of the National Biosafety Committee, the National Root Crops Research Institute, Umudike and IAR, Zaria, are carrying out Confined Field Trials on transgenic cassava, sorghum and cowpea. The approval was based on the provisions of the National Biosafety Guidelines. The guidelines have a provision for field-testing bio-engineered crops.

**Current Status:**

I). The Maruca - Resistant Cowpea Field Trial at IAR Zaria

This biotech event was developed by CSIRO Plant Industry Laboratory at Canberra, Australia. The trial is sited on the Research Farm of IAR, Ahmadu Bello University, Zaria. The field trial is to evaluate transgenic events (lines) for their reaction to the legume pod boring insect, Maruca. A line will be considered resistant if it does not sustain damage by the insect. In addition, effect of environment, agronomic performance such as plant morphology, maturity and yield will be assessed. The trial will be replicated four times.

**Current status:**

**A: The cowpea maruca (insect) resistant confined field trials (CFT):**

- Confined field trials (CFT) has been conducted on the cowpea maruca (insect) resistant.
- Preliminary results show that CFT3 is a very successful trial. The proof of the concept is not in doubt and the data presented showed that the experiment is more than 95% significant in controlling cowpea pod borer (maruca).
- The physical and biological control mechanisms put in place by the institute to mitigate potential environmental risk conformed to established guidelines.
- The confined field trial for this event has been successfully concluded.
- The multi-location trials - a project is funded by African Agriculture Technology Foundation (AATF), Nairobi and aided by USAID and other Donors

**B: The Africa Bio-fortified Sorghum (ABS) Field Trial in IAR, ABU Zaria**

The Africa Bio-fortified Sorghum (ABS) has completed one successful trial and will soon commence the second trial.

**C: The Bio-cassava Plus (BC+) Field Trial at Umudike**

The CFT for Biocassava Plus is being conducted by the National Root Crop Research Institute, Umudike. The transgenic cassava, named "Super Cassava," which is fortified with vitamin A was

developed at the Danforth Center. It was established in October 2009 and is funded by the Bill & Melinda Gates Foundation.

**Current Status:**
It is presently undergoing the second field trial where the activity carried out on a daily basis is the taking of normal growth parameters. The third trial is expected to commence soon. The actual trait of interest is measured at harvest period.

NABDA is collaborating with the research institutes in creating awareness among Nigerian cowpea and cassava clientele, while the Biosafety Office of the Federal Ministry of Environment ensures compliance to Nigerian Biosafety guidelines in the conduct of the trial. Internationally, AATF provides funding platform, planning, capacity building and linking with other donors such as USAID; the Network for the Genetic Improvement of Cowpea in Africa leverages scientific input of members for planning and linkage, Program for Biosafety Systems assists in regulatory compliance capacity building and advice.

**D. Participation in Meetings of International Standard-Setting Organizations**
Nigeria signed the Convention on Biological Diversity in 1992 and ratified the instrument in 1994, and was an active participant in the negotiations leading to the adoption of the Cartagena Protocol. Officials of key biotech agencies such as the Federal Ministry of Environment and NABDA regularly attend meetings of international standard-setting bodies.

**E. Stacked events**
The NBC does not require additional approval for stacked events.

**F. Review and Approval Process for Biotech Products for Planting and Import**
The implementation guidelines for the new law have not yet been developed. However, the National Biosafety Guidelines adopted by the GON in 2001 have provision for approval for field-testing bio-engineered crops.

**G. Coexistence**
Nigeria's new biosafety law is silent on co-coexistence. However, there are provisions for monitoring. The relevant portion of the law states, "for the purpose of biosafety, monitoring shall be used as a tool to ensure that the concerns expressed by stakeholders are addressed, ensure compliance with the terms of approval, confirm claims and trace the fate of LMOs/GMOs."

**H. Labeling**
The new biosafety law requires the mandatory labeling of all products of agricultural biotechnology in order to protect "consumers right to know." Although not specific to biotech products, existing labeling regulations are being enforced by NAFDAC, the GON's regulatory body responsible for food product manufacturing, importation, advertisement and distribution in Nigeria. NAFDAC regulations require food labeling to be informative and accurate. FAS Lagos has opened dialogue with NABDA, NAFDAC and the Ministry of Environment on the operational guidelines of the law to ensure that the requirement of mandatory labeling does not obstruct free trade. The Ministry of Environment is currently leading the effort to develop guidelines for labeling.

**I. Biosafety Protocol**
Nigeria signed the Cartagena Protocol on Biosafety in 2000 and its instrument of ratification was signed by the President on 30th November, 2002. The protocol came into force in September, 2003. Nigeria, having signed and ratified the protocol, is now under obligation to implement it. The implementation of the protocol is slow and has had no effect on trade.

**J. Biotechnology-Related Trade Barriers**
Post is not aware of any biotechnology-related trade barriers affecting U.S. exports to Nigeria.

**K. Pending Legislation**
The Nigerian Biosafety Law was enacted on June 1, 2011 and is currently awaiting the signature of the President.

**L. Technology Fees**
Nigeria does not have any technology fees for bio-engineered crops since there is no legislation in place.

**J. Monitoring and Testing**
In the absence of biotechnology law, the existing regulatory framework concerning quality and safety of food, drugs, chemicals, and other regulated products sold and consumed in Nigeria (whether locally produced or imported and whether they emanated from conventional or biotechnological processes) are applied to regulate and enforce GM related issues. These include standard setting, information control and imposition of criminal liability on any person who produces violate any food or drug law. Some of these laws are fixed in Nigeria's National Biotechnology Policy; National Biosafety Guidelines; NAFDAC Act; Food, Drug and Related Products (Registration etc) Act; etc.

The GON therefore simply employs uniform approach for monitoring and testing products (both conventional method or biotechnologically developed) provided it is safe for human and animal consumption as well as environmentally friendly. The current approach enables a biotechnology company to adopt those safety standards best known to it as not contradicting laws on safety, quality and advertisement of Nigeria.

**Section IV. Plant Biotechnology Marketing Issues:**

**A. Market Acceptance**
Generally, most Nigerians are not aware of products of modern agricultural biotechnology and the issues involved. Information and discussions on modern biotechnology have been undertaken largely among GON officials, scientists and researchers. Nigerian farmers and the general public need to be educated about the technology.

Wheat importers in Nigeria generally favor the precautionary approach to biotechnology. They have learned about bio-engineered food products primarily from the U.S. - EU debate over biotechnology. Overall, Nigerian wheat importers historically have expressed the opinion that the U.S. should not introduce bio-engineered wheat into the market until all long-term health concerns are resolved. This stance has moderated some recently. Nigeria was one of the largest importers of U.S. wheat in the world in 2012 with the country's wheat import from the United States estimating about 3.0 million

tons (worth over $1.0 billion).

**B. Focus Group Survey**

The results of a focus group survey on the attitude of the public to biotechnology revealed that about 40 percent of respondents would not mind consuming bio-engineered food products. Many respondents, especially among those with little education, were ignorant of biotechnology and its potential usefulness. While some respondents did express concern about the long-term health effects of consuming such products, these concerns seem to be overshadowed by their basic need for affordable food. The survey also revealed a marked preference for biotech products developed locally to those that are imported.

Another national survey on public awareness of agricultural biotechnology in Nigeria was conducted in May 2004, preparatory to the launch of the Nigeria Agriculture and Biotechnology Project (NABP). Survey results suggest that the Nigerian public is only marginally aware of biotechnology. Those who are aware have heard something about biotechnology through stories in the news media. Most Nigerians do not have a clear understanding of biotechnology and many still confuse the technology with conventional breeding techniques.

Nigerians are also not very knowledgeable about national and international policy issues relating to biotechnology. However, Nigerians are interested in the innovation and wish that it could be utilized to address the persisting problems of poverty in the country and one-third of respondents stated that they would be willing to eat GE food if given the opportunity.

Following press statements by key international and national scientists and a series of workshops conducted by USAID funded NAPB for civil servants, policy makers, legislators and for the members of the media, the level of awareness of issues relating to agricultural biotechnology has improved somewhat. Most newspaper articles are well balanced and are devoid of misconceptions about biotechnology. Several anti GE NGOs are active in the country.

**Section V. Plant Biotechnology Capacity Building and Outreach:**

**A. U.S. Government or USDA Funded Outreach activities**

Over the last five years, USDA has helped to fund scientists to work on biotechnology at the IITA, under its technical assistance program. In addition, the Agricultural Affairs Office in Lagos utilized the Cochran Fellowship Program to provide training in agricultural biotechnology in the U.S. for four Nigerian scientists during the same period.

Since 2004, agricultural biotechnology in Nigeria received a boost with two linked initiatives funded by USAID; namely, the West African Biotechnology Network (WABNET) and NABP, implemented by IITA. NABP was designed to assist Nigeria in building the framework for decision-making that will facilitate access to the opportunities biotechnology offers and will ensure the safe and effective application of this technology to improve agriculture.

A key element of the project is to improve implementation of bio-safety regulations; and, enhance public knowledge and acceptance of biotechnology. The project developed collaborative linkages with and provided facilities to some Nigerian universities/institutes to facilitate implementation;

NABDA for biotech information dissemination; SHESTCO for training of scientists; National Root Crops Research Institute (NRCRI) for plant genetic transformation; Institute for Agricultural Research (IAR) for tissue culture and University of Agriculture, Abeokuta for advanced biotechnology training.

In early 2009, USAID sponsored a study tour trip to the Philippines GE crop Farms for the House Committees members on Agriculture, Environment and Science and Technology to have a practical experience on GE crops and how they are being regulated as well as the legislation procedure. These activities have assisted in the eventual enactment of the biosafety law.

The International Food Policy Research Institute (IFPRI) also coordinated through HarvestPlus with other local and international research institutions with presence in Nigeria to develop three new vitamin A-rich 'yellow-colored' cassava varieties in Nigeria. Funded by the U.S. government through USAID, the cassava would provide more vitamin A in the diets of over 70 million Nigerians who eat cassava on daily basis. Vitamin A deficiency (VAD) is widely prevalent in sub-Saharan Africa – afflicting about 20 percent of pregnant women and approximately 30 percent of children under-five in Nigeria. VAD can lower immunity and impair vision, which can lead to blindness and even death.

Since 2001, the U.S. government (USG) has also supported Nigeria to establish the Public Biosafety Systems (PBS) guidelines which created provisions for field testing of GE crops. Since 2005, the PBS has worked in Nigeria to support the development of draft biosafety policies and laws, and to provide technical training in biosafety review and regulatory oversight. Nigeria's Ministry of Environment's Biosafety Unit is currently leading the drafting of biosafety legislation.

In early 2009, Nigeria's NBC endorsed two applications for CFTs of GE crops, one for nutritionally enhanced cassava and one for insect-resistant (Bt) cowpea. PBS, in collaboration with the AATF worked to facilitate the submission and review by regulatory authorities of the latter CFT application. It also provided material and manpower resources that assisted the country establish biosafety institutions and processes that will guide against the misuse of biotechnology. The support included providing and supporting capacity for the multi-locational CFT and inspections of GE crops which aimed at improving the skills and proficiency of Biosafety Regulators on the conduct of CFT inspection for GE crops, particularly on multi-location trials. The USG is also supporting OFAB which also assembles knowledgeable stakeholders to interact and discuss issues regarding biotechnology in Nigeria and the rest of Africa.

Late 2012, the USDA also sponsored Nigerian journalists, filmmakers, actors and some related GON policy makers on a familiarization tour of facilities, institutions, firms, farms, etc. to further expose them to the application of modern agricultural biotechnology in the United States. The tour is assisting to further the enlightenment of Nigerian stakeholders to agricultural biotechnology.

**B. Country Specific Needs**

The Agricultural Affairs Office (AgLagos) and U.S. Mission Nigeria Biotech Outreach Program will attempt to support OFAB, organized monthly by NABDA. U.S. Consulate Lagos and Embassy Abuja will continue to assist NABDA to bolster OFAB. They will also sponsor national and international experts on biotechnology to speak on the benefits of biotechnology as a tool for climate

change mitigation and for enhancing food security in Nigeria.

**C. Institutional Capacity Building**
Local research institutions lack capacity in scientific DNA manipulation and laboratory management. FAS/Lagos will continue to support the strengthening of local capacity if funding becomes available.

**Section VI. Animal Biotechnology:**
A transgenic tilapia project at the National Institute for Freshwater Fisheries Research (NIFFR), New-Bussa has been proposed. The institute would collaborate with the World Bank for the project with the latter would be providing the equipment and other resources. The institute had earlier collaborated with Hebrew University of Jerusalem in Israel to embark a similar project. According to one of the participating NIFFR researchers, the project was conducted outside the country for lack of domestic biotech law and equipment.

**Section VII. Author Defined:**

**Reference Materials**
- Nigeria Biosafety Guidelines 2001
- Nigeria Biosafety Law 2011
- Draft National Biosafety Framework
- National Biosafety Policy

Copies of these documents are available in the Agricultural Affairs office and the Biosafety Department of the Ministry of Environment.

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