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2014 Ghana Agricultural Biotechnology Report

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Report Highlights:

The President of the Republic of Ghana signed the Ghana Biosafety Act, 2011 (Act 831) December 2011 following the passage of the Biosafety Bill by the Ghanaian Parliament, in June 21, 2011. This will create a favorable environment for the development and commercialization of biotechnology seeds and crops. The Biosafety Act, 2011 (Act 831) establishes the National Biosafety Authority (NBA) as the administrative body that will manage the implementation of all issues related to Biotechnology in Ghana. The substantive Chief Executive (CEO) would be appointed by August this year. The crops that have been approved by the interim NBA for confined trials include Bt cowpea, Bt cotton, NUWEST rice and high protein sweet potato. However, only Bt. Cotton and has been approved to be field tested in Ghana. Ghana's biosafety law is considered user friendly as it does not contain any labeling requirements for genetically engineered food products or strict liability provisions. This should help the country to respond to the challenges of food security and climate change.

Section I. Executive Summary:

U.S. food exports to Ghana consist primarily of rice, poultry, wheat and consumer oriented food products. U.S. Census Trade Data showed an all time high in total US agricultural exports in CY 2013 with exports at \$198.8 million up from \$176.6 million in CY 2012. Although US rice exports to Ghana is high, rice from Asian sources is in strong competition. U.S. rice exports in CY 2013 were an all-time high at \$68.7 million up from \$62 million in CY 2012. The U.S. is one of the major suppliers of poultry in Ghana with the main competitor being Brazil and the European Union. In 2013 U.S. exports of poultry to Ghana continued at record levels at \$82.7 million up from \$62.8 million in 2012. US wheat exports to Ghana were \$9 million in CY 2013 down from \$33.4 million in CY 2012. U.S. exports of high value products (HVP), including vegetable oils, fruit and vegetable juice, pulses, processed fruits and vegetables, sweeteners, wine and beer, and other products, continue to grow reaching about \$19 million in CY2013 up from \$12 million in CY 2012.

The President of the Republic of Ghana signed the Ghana Biosafety Act, 2011 (Act 831) in December 2011 following the passage of the Biosafety Law by the Ghanaian Parliament, in June 21, 2011. The Ghana Biosafety Act, 2011 (Act 831) establishes the National Biosafety Authority as the administrative body responsible for all issues related to Biotechnology in Ghana. The governing body of the NBA is a Board whose chairman and members are yet to be appointed by the President. Currently a National Focal Point for Biosafety has been established as the secretariat that receives the Biotechnology applications. The Chief Executive (CEO) position of the NBA was advertised in May 2014 and official sources indicate that by August 2014 a substantive CEO would be appointed.

The Act establishes biosafety regulations that will govern procedures for contained research work and field trials on biotechnology products; release into the environment, commercialization, importation, exportation and transit of agricultural biotechnology products. The Act does not apply to biotechnology products that are pharmaceuticals for human use.

The Ghana Biosafety Act, 2011 (Act 831) is creating an enabling environment for the development and commercialization of biotech seeds and crops such as biotech varieties of cotton, sweet potato, cassava, cowpea, corn, soy, and rice. The Biosafety legislation does not contain any labeling requirements for biotech or genetically modified food products, or strict liability provisions. The Biosafety Act 2011 (Act 831) stipulates that, all biotechnology products will require a permit from the National Biosafety Authority. Under the biosafety law, existing regulatory agencies such as the Ghana Food and Drugs Authority (FDA); Environmental Protection Agency (EPA); Ministry of Food and Agriculture (MOFA) and Ghana Customs will be responsible for monitoring and enforcement of biotechnology products.

Prior to the Passage of the Biosafety Bill the Ghana parliament passed a Biosafety Legislative Instrument (LI) in May 2008 that authorized the conduct of confined field research/trials of genetically engineered products but did not allow for the commercialization or release of products to farmers and consumers.

Ghana ratified the Convention on Biological Diversity on August 29, 1994 and the Cartagena Protocol on Biosafety on May 30, 2003. The United Nations Environment Program and the Global Environment Facility (UNEP/GEF) provided financial and technical support for the drafting of the Biosafety Framework for Ghana that was completed in July, 2004. The USAID-sponsored Program for Biosafety Systems (PBS), implemented by a consortium led by the International Food Policy Research Institute (IFPRI), also played a significant role in developing the underlying legal framework for biotechnology and biosafety policy in Ghana in 2004-2008.

SECTION II PLANT AND ANIMAL BIOTECHNOLOGY

Chapter 1: Plant Biotechnology

Part A: Production and Trade

a) Product Development:

The Ghana Biosafety Act, 2011 (Act 831) has paved the way for a number of biotech seeds and crops to be developed for the Ghanaian market over the next few years, including varieties of cotton, sweet potato, cowpea rice, corn, soy and cassava. The implementing regulations of biosafety have been drafted and are currently being reviewed by the Office of the Attorney General. When finalized, this should allow for commercialization, import, export, and transit of Genetically Engineered (GE) crops in Ghana. The capacity and knowledge exist for the development and production of modern agricultural biotechnology crops. According to the Government of Ghana (GOG) sources, most research institutes have stated that biotechnology activity in Ghana is still at the diagnostic level. Scientists are assessing the genetic diversity of both food crops and industrial crops, focusing on pests, diseases, yields and maturity periods as a prelude to modern biotechnology development. The Savannah Agricultural Research Institute (SARI) has advanced in its biotechnology research working mostly on BT Cotton and BT Cowpea. A new facility for biotechnology has been constructed at the Crop Research Institute in Kumasi which is yet to be equipped.

There are no biotechnology crops currently under development in Ghana that will be on the market in the near term. With the passage of the Ghana Biosafety Act, 2011 (Act 831), some contained/confined experiments/trials using modern agricultural biotechnology methods are being carried out by research institutes and universities in Ghana. The crops that have been approved by the National Biotechnology Committee (NBC) for confined trials include Bt cowpea, high protein sweet potato, rice and Bt cotton. Other contained researches being undertaken are virus disease resistance in cassava, and improvement of lysine strain in corn. However, Bt. cotton has been approved for field trials in Multi-locations in Ghana.

Presently biotechnology research is being regulated by the National Biotechnology Committee (NBC). This is because the new law states that *"until regulations are made to implement the law, the L.I 1887 which regulates research will continue to operate as if made under the law"* according to GOG sources.

b) Commercial Production: Ghana does not commercially produce any biotechnology crops.

c) Exports: Not applicable

d) Imports: Ghana officially does not import bioengineered products. Agricultural products such as soybean meal, soybean oil and processed foods are freely imported from the United States, the European Union, Argentina and Brazil that may contain biotechnology elements.

d) Food Aid: There are no U.S. food aid programs currently in Ghana.

Part B: Policy

a) Regulatory Framework:

The GOG established the National Biosafety Committee in 2002 whose mandate was to draft the Biosafety Bill, produce guidelines for the implementation of the biosafety law and to prompt the GOG to move forward on Biotechnology issues. It is made up of officials of government institutions, scientists, farmer organizations, and other stakeholders. It is a working committee that continuously dialoged with the GOG for the passage of the Biosafety law. It drafted the Biosafety Bill in 2004 and produced the National Biosafety framework and biosafety guidelines.

The Ministry of Environment, Science, Technology and Innovation (MESTI) which is the focal point for Biosafety in Ghana is yet to established the National Biosafety Authority to manage the implementation of the Ghana Biosafety Act 2011 (Act 831). The Chief Executive (CEO) position of the NBA was advertised in May 2014 and official sources indicate that by August 2014 a substantive CEO would be appointed. Currently MESTI is in the process of forming the Board that will manage the NBA.

i. Responsible Institutions for Implementing the Biosafety Bill

The institutions to be set up by the GOG now that the Ghana Biosafety Act 2011 (Act 831) has been passed are:

The National Biosafety Authority (NBA)

The Technical Advisory Committee (TAC)

Institutional Biosafety Committees (IBC)

NBA is the designated national authority on all issues related to modern agricultural biotechnology in Ghana. All applicants, except for contained use and field trials, will go through this authority. The governing body of the NBA is a Board whose chairman and members are appointed by the President for a period of three years.

TAC will consist of not more than eleven individuals from the regulatory agencies and from the private sector who are knowledgeable in science and socio-economic matters related to biotechnology. TAC is the national advisory committee on matters concerning or related to biotechnology and will carry out risk assessments of applications at the request of the Board. The Minister of Food and Agriculture appoints the members based on recommendations by the Board for a period not exceeding five years. IBC reviews applications for contained use and field trials.

The regulatory agencies of the Government of Ghana responsible for monitoring and enforcement will also be represented on the TAC. They include:

- The Food and Drugs Board (FDB)– Food safety and related matters
- Plant Protection and Regulatory Services/MOFA – Plant health and related matters
- Veterinary Services Department/MOFA – Animal health and related matters
- Environmental Protection Agency – Environmental releases and related matters
- Customs, Excise and Preventive Services – Border handling of biotechnology products in collaboration with agencies listed above.

ii. Role and membership of the National Biosafety Authority (NBA)

The National Focal Point on Biosafety in Ghana is the Ministry of Environment, Science, Technology and Innovation (MESTI). MESTI will be responsible for liaising with the Secretariat of the Convention on Biological Diversity for the administrative functions required under the Cartagena Protocol on Biosafety.

The Ghana Biosafety Regulatory System is a coordinated framework and the Biosafety Act establishes the National Biosafety Authority (NBA), which will be interdisciplinary in nature, to process applications relating to biotechnology substances under the Act. The NBA will ensure adherence to the Cartagena Protocol on Biosafety through implementation of the national biosafety guidelines and other regulations. Additionally, the Act makes provision for a governing Council, the Board, to have a technical advisory committee that will provide advice to the Board. Establishment of an Institutional Biosafety Committee (IBC) is also provided under the Act. The Biosafety Act also provides for issuance of further guidelines to facilitate better performance of the National Biosafety Authority (NBA).

The NBA will have the powers as stated under section 39 of the Biosafety Act 2011 (Act 831) to draft and adopt regulations or guidelines to ensure safety of humans and the environment; stop a project through the relevant IBC after establishing that further continuation of the project is unsafe to the personnel, community and environment; and approve deregulation of all regulated materials for free movement and commercial release on the recommendation of relevant IBCs. The Act states that a person or organization intending to introduce a bioengineered product into the environment or import or place a bioengineered product on the market must first obtain the written approval of the NBA.

Composition of the governing body of the National Biosafety Authority includes:

1. An expert in biotechnology and related biological sciences including biosafety, as Chairman;
2. The Chairman of the Technical Advisory Committee;
3. The Chief Director, or the representative of the Ministry of Environment, Science, Technology and Innovation;
4. One representative, Association of Ghanaian Industries (AGI);
5. One legal practitioner of not less than ten years experience;
6. One representative of non-governmental organizations (NGO);
7. One member from Academia;
8. One member from the Council for Scientific and Industrial Research;
9. One member from the Ministry of Food and Agriculture;
10. One member from Ministry of Health;
11. Customs Division of the Ghana Revenue Authority;
12. The Chief Executive Officer, National Biosafety Authority.

iii. Assessment of Political Factors

The Biotechnology and Nuclear Agricultural Research Institute (BNARI) of the Ghana Atomic Energy Commission (GAEC) coordinated the project to draft a Biosafety Framework for Ghana between November 2002 and July 2004. UNEP/GEF provided financial and technical support for the project. The framework is unique to Ghana but it is modeled after the UNEP/GEF blueprint which includes: a government policy on biosafety, a regulatory regime, a system to handle requests for authorizations (including risk assessment, decision-making) and administrative functions, systems for ‘follow up’ (such as enforcement and monitoring for environmental effects), and systems for public awareness and participation. The text of the Framework and draft Biosafety Bill is available at the UNEP/GEF website: (www.UNEP.ORG).

Before the Ghana biosafety law was passed the Ghanaian’s position on biotechnology was guided by other principles stated in the National Science and Technology Policy (2000), the Constitution (Art 36, 41) and the Ghana Poverty Reduction Strategy (GPRS). However, at the same time the GOG ratified the Cartagena Protocol on Biosafety in May 2003. The Ghana biosafety Act 2011 (Act 831) have been passed and appears favorable to the use and acceptance of biotechnology. Therefore, the “precautionary approach and the environmentally sound management of biotechnology” are also factors that were strongly considered in drafting the Framework and Biosafety Act. For example, the Act begins by stating that the first objective is “to ensure, in accordance with the precautionary principle, an adequate level of protection in the field of safe transfer, handling and use of Genetically Modified Organisms (GMO) that may have an adverse effect on the environment.”

iv. Distinctions Between regulatory treatment of approval:

The Ghana Biosafety Act 2011 (Act 831) approval process is the same for food, feed, processing and environmental release.

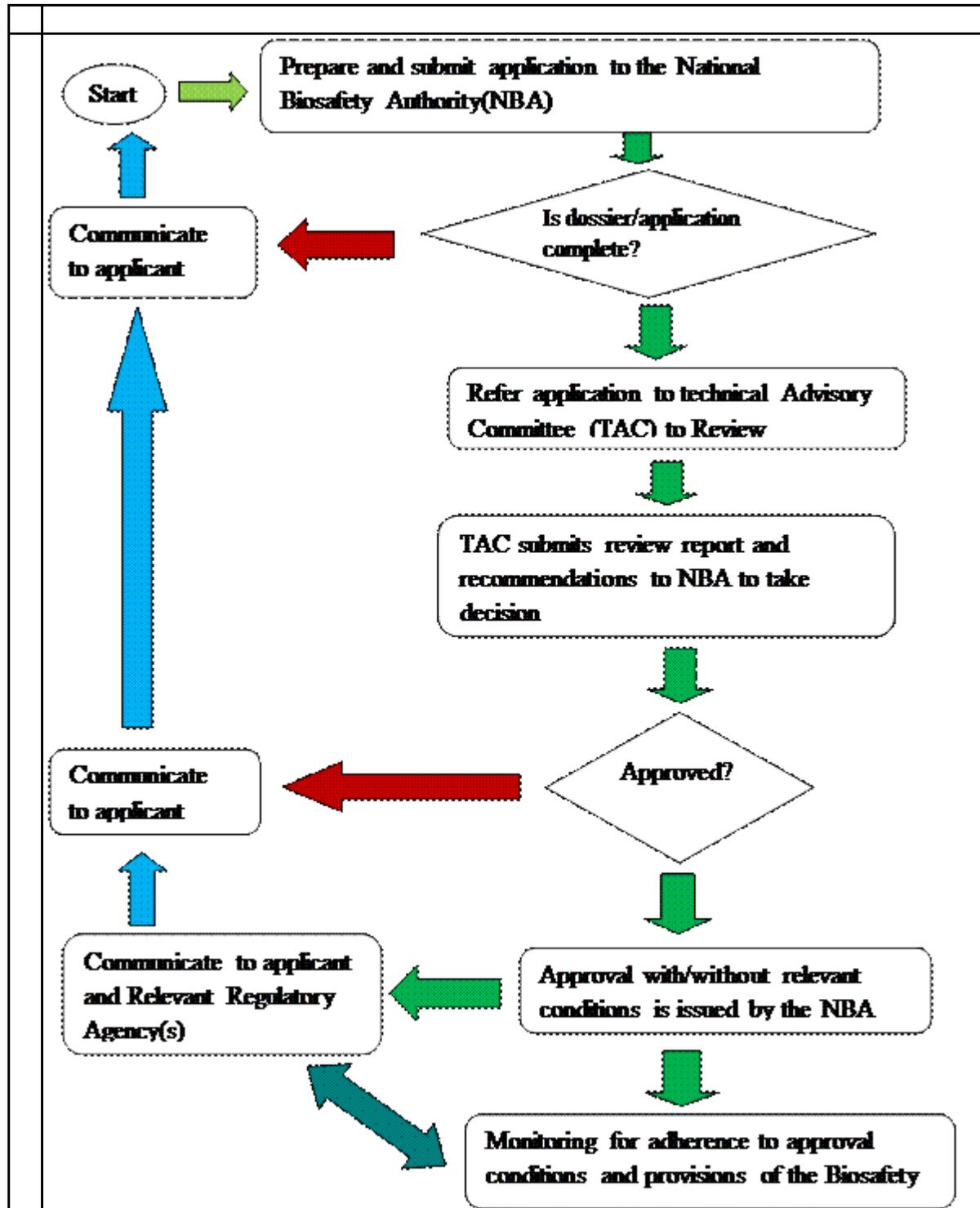
v. Reference to pending legislations and regulations:

FAS Accra is not aware of any pending legislation and regulations with the potential to affect US exports. The process of drafting implementing regulations has been slow because of change in administration.

vi. Timeline for approvals

The Ghana Biosafety Act 2011 (Act 831) does not contain any timeline for the approval of biotech or bio engineered food products. Timeline for approval is dependent on the application submitted to the NBA. Below is the flow chart for the review of biosafety applications:

FLOW CHAT FOR BIOSAFETY APPLICATION REVIEW PROCESS IN GHANA



Source: Ministry of Environment, Science, Technology and Innovation (MESTI)

vii. Any trade policies on Biotechnology without legislation and/or regulations: Not applicable.

b) Approvals:

At present no biotechnology crops (industrial crops, food crops, or feed) has been approved or registered in Ghana for cultivation, import or export.

c) Field Testing:

Since the passage of the Ghana Biosafety Act 2011 (Act 831) only Bt. cotton has been approved for field testing in multi-locations in Ghana. Other crops being developed for future field testing are Bt cowpea, high-protein sweet potato and nitrogen-efficient, water-efficient and salt-tolerant rice.

d) Stacked Events:

The NBA does not require additional approval for stacked events.

e) Additional Requirements:

The Ghana Biosafety Act 2011 (Act 831) does not specify any additional product/seed registration or re-registration.

f) Coexistence:

The Ghana Biosafety Act 2011 (Act 831) is silent on co-existence.

g) Labeling:

The Biosafety legislation does not contain any labeling requirements for biotech or genetically modified food products, or strict liability provisions. Ghana requires labeling for packaged foods and feeds. The Food and Drugs Authority (FDA) General Labeling Rules, 1992, (L. I. 1514) stipulates that food labeling be informative and accurate. Labeling of packaged and prepackaged products is for purposes of health, food safety and need to know. The minimum labeling requirements are that labeling should be clear, concise and in English; should have product name, net mass/weight, batch number and expiry date; list of ingredients and food additives must be stated. It is mandatory to label any prepackaged food item that has nutritional composition. General labeling regulations for food products are strictly enforced, but they are not specific to biotechnology products.

h) Trade Barriers:

FAS/Accra is not aware of any biotechnology-related trade barriers affecting U.S. exports to Ghana.

i. Intellectual Property Rights (IPR):

Ghana is a member of the World Intellectual Property Organization (WIPO), the Universal Copyright Convention (UCC) and the African Regional Industrial Property Organization (ESARIPO).

Manufacturers and traders are strongly advised to patent their inventions and register their trademarks in Ghana, and to do so through a patent or trademark agent. Fees for registration vary according to the nature of the patent, but local and foreign applications pay the same rate.

The Ghanaian system for patent and trademark protection is based on British law, and it was only in 1992 that the patent laws of the UK ceased to apply in Ghana. Local courts offer redress when infringements occur, though few cases have been filed in recent years.

The Copyright Act was passed in 1961 and the Trademark Act in 1965 (amended in 2004). The Copyright Administration in Ghana is responsible for patents, copyright and trademarks. Registration of a trademark permits the holder to have the exclusive right to use the registered mark for a specific

product or group of products. Upon approval of a patent, the applicant is given the exclusive right to make, export, import, sell, use a product or apply a patented process.

The Copyright Act of 1965 (amended in 1970 and 2005) makes it a criminal offense to make counterfeit, reproduce, export, import, exhibit, perform, or sell any work without the permission of the copyright owner. The Biosafety law does not contain any IPR requirements for biotechnology food products.

j) Cartagena Protocol Ratification:

Ghana ratified the Convention on Biological Diversity on August 1994 and the Convention's Cartagena Protocol on Biosafety on May 30, 2003. As stated in the National Biosafety Framework for Ghana, the Protocol is in consonance with the Ghana Constitutional obligations, Ghana environmental law and policy and the fulfillment of Ghana's treaty obligations. FAS/Accra is not aware of any significant impact on trade.

k) International Treaties/Fora: FAS/Accra is not aware of any biotechnology position that Ghana may have taken in International Treaties/Fora.

l) Related Issues: Not applicable

m) Monitoring and Testing:

The Ghana Biosafety Act 2011 (Act 831) makes provision for the establishment of a monitoring body for biotechnology products. However, a monitoring program of genetically engineered food products is yet to be developed. FAS Accra is not aware of any active testing for genetically engineered products.

n) Low level Presence Policy: FAS/Accra is not aware of any Low level Presence Policy.

Part C: Marketing

a) Market Acceptance

In Ghana, the majority of people are not aware of modern agricultural biotechnology products and the issues involved. The academia, researchers and GOG officials are mostly the stakeholders in biotechnology discussions. Very few farmer representatives are involved in biotechnology fora. Most food producers would accept biotechnology if yields of genetically engineered food product will increase. Post discussions with representatives of some local Farmer Organizations (NGOs), revealed that farmer organizations have been involved in the development of the Biosafety Framework for Ghana. Their major concerns, regarding public awareness, participation and decision-making have been included in the biosafety guidelines and expect that their views are addressed during the implementation process.

b) Public/Private Opinions:

Over the last few months there has been an increased campaign by anti-GM critics against the introduction of biotechnology which has made the headlines in Ghana. They have increasingly linked the Plant Breeders Bill, which is currently before parliament, to the introduction of Genetically Engineered (GE) food products into Ghana. However, the Ghana Biosafety Act 2011(Act 831) that allows the introduction of GE crops in Ghana was passed in 2011. These groups have made coordinated attempts to confuse the general public over what the Plant Breeders' Bill really seeks to achieve. The anti-GM activists include, the Food Sovereignty Ghana (FSG), Friends of the Earth, Centre for Indigenous Knowledge and Organizational Development (CIKOD), Ghana and the Convention People's Party (CPP).

Most Ghanaians lack knowledge and understanding of modern biotechnology and rely on opinion leaders (especially in the media) to understand the issues of such nature. This has left huge gaps for the anti-GM groups to exploit by misinforming the public on issues of genetic modification. This misinformation campaign has led to several bodies calling for government to exercise caution with the

introduction of GMOs; such as the Ghana Health Service (GHS), Ghana Catholic Bishops' Conference, and Ghana Export Promotion Council. Their campaign seemed to be gaining ground in the public domain. However, several individuals and groups have waged vigorous counter campaign in the media to send the right information to Ghanaians and to reverse the growing anti-GM sentiments in the country.

Open Forum on Agriculture Biotechnology in Africa (OFAB) engaged policy makers such as the science and technology sub-committee of parliament, to educate them on genetic modification and biosafety. Together with International Service for Acquisition of Agric-biotech Application (ISAAA) and African Biosafety Network Expertise (ABNE), Program for Biosafety Systems(PBS)-Ghana facilitated the visit by an entourage of the Ministry of Environment, Science, Technology and Innovation (Minister, Deputy Minister and Directors) and the Ministry Trade and Industry (Deputy Minister) to the field trials of Bt Cowpea and Bt Cotton in Northern Ghana. At these sites, the various ministers made clear positive government position.

Following earlier comments by FSG that they represented the concerns of farmers in Ghana, PBS-Ghana together with OFAB organized the Ghana National Association of Farmers and Fishermen (GNAFF), the mother body of all farmers and fishermen in Ghana to state their support for the continued research into biotechnology solutions.

<http://graphic.com.gh/news/general-news/14098-gnaff-supports-adoption-of-gm-food.html>

According to the Coordinator, PBS in collaboration with OFAB and ABNE are planning to have other farmer groups to come out publicly in support of biotechnology in Ghana. They also intend to buy space in key print media to highlight the benefits of GM technology; Assist key farmer groups to make positions on the introduction of GM; Identify individuals who will promptly respond to issues of GM on radio and in the newspapers.

c) Marketing Studies:

Information and discussions of modern biotechnology have been ongoing among GOG officials, scientists and researchers. Post is not aware of any specific study assessing Ghanaians' acceptance of biotechnology products. However, Post expects that the Ghanaian producer, importer, retailer and consumer would accept biotechnology inputs if it increases seed production and income. Currently Ghana imports processed products from South America, Europe and the United States that may contain biotechnology elements.

Ghana currently exports non-traditional food products especially pineapples, bananas and chili peppers to Europe.

Part D: CAPACITY BUILDING AND OUTREACH:

a) Activities:

Ghana is clearly moving forward on biosafety and biotechnology with the passage of the Biosafety Act 2011 (Act 831) in December 2011. Ghana could benefit from capacity building outreach programs that would support science based regulatory efforts and provide accurate information to the broader public on the positive benefits of biotechnology.

USDA has funded biotechnology training over the last few years via the Norman Borlaug Fellowship and Cochran Fellowship programs. In addition, USAID, through the Global Program for Biosafety Systems (PBS), has been promoting the judicious use of modern biotechnology in Ghana to increase agricultural productivity with linkages to regional and global markets.

In 2013, the Regional Environmental Hub in Accra with the support of Economic and Business Affairs (EB)Bureau's Agricultural Biotechnology Outreach Funds, hosted renowned biotech expert Dr. Claude Fauquet for a two-week biotechnology outreach program. Dr. Fauquet, along with panelists from

USAID, the Ministries of Environment and Agriculture, and the Forum for Agricultural Research in Africa, gave presentations covering Ghana's biosafety law, ongoing biotechnology research, and other government activities in biotechnology and modern agricultural research. The program was attended by an overflow audience of more than 80 academics, researchers, activists, members of the electronic and print media. The program received substantial coverage in the local media. The comments made and positions put forth helped to shed light on the potential benefits and fears of adopting biotechnology and gave both proponents and skeptics a better understanding of the reasoning and motivation on both sides of the issue. The outreach programs took place in Accra, Kumasi and Techiman. The biotechnology outreach program for 2014 is currently ongoing with very positive results.

b) Strategies and Needs:

In order to facilitate the GOG effort to move forward on biotechnology regulation, there is the need to continue to boost awareness among government officials, academia, and other stakeholders especially farmers. Capacity building and training is required for the personnel of the Ministries of Food and Agriculture, Environment, Science and Technology, and other officials to be able to develop a biosafety protocol. Technical Assistance may also be welcome in setting up the National Regulatory Authority office and secretariat to draft implementing regulations for the Biosafety Act 2011 (Act 831); to accept and consider applications for confined field trials or commercialization of biotech products; and to conduct outreach and awareness raising activities among potential applicants, agribusiness, farmers, and stakeholders regarding the regulatory system and application process.

Post also encourages partnering with Ghanaian counterparts in the discussion of biotechnology in international fora. Ghanaian leadership in opinion and rulemaking in Africa would be helpful in supporting a science-based dialogue with African and regional audiences.

SECTION III

Chapter 2: Animal Biotechnology

Part E: Production and Trade

- a) Product Development: Not applicable
- b) Commercial Production: Not applicable
- c) Exports: Not applicable
- d) Imports: Not applicable

Part F: Policy

- a) Regulation: Not applicable
- b) Labelling and Traceability: Not applicable
- c) Trade Barriers: Not applicable
- d) Intellectual Property: Not applicable
- e) International Treaties/Fora: Not applicable

Part G: Marketing

- a) Market Acceptance: Not applicable
- b) Public/Private opinions: Not applicable
- c) Market studies: Not applicable

Part H: Capacity Building and Outreach

- a) Activities: Not applicable
- b) Strategies and Needs: Not applicable

Reference Material

1. National Biosafety Framework Document [ISBN: 9988-8275-4-7]
2. National Biosafety Guidelines [Part I-Introduction to biosafety Guidelines] [ISBN: 9988-8275-0-4]
3. National Biosafety Guidelines [Part II-Biosafety Guidelines for laboratory and field work] [ISBN: 9988-8274-3-1]
4. National Biosafety Guidelines [Part III-Biosafety Guidelines for movement of regulated materials and commercial releases][ISBN: 9988-8274-8-2]
5. Risk Assessment Guidelines [ISBN: 9988-8275-1-2]
6. Public Participation Guidelines [ISBN: 9988-8275-2-0]
7. Administrative Guidelines [ISBN: 9988-8275-3-9]
8. <http://www.unep.ch/biosafety/development/countryreports/GHNFrep.pdf>
9. <http://www.biodiv.org>

Note: The first two documents and highlights of the others can be found in the UNEP website given in 8 above. All the documents related to this report can be accessed on the website indicated in 9 above.

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