



Open Forum on Agricultural Biotechnology in Africa (OFAB) Kenya Chapter 2015 Report (Vol IX)

Experiences in sharing knowledge and information on
agricultural biotechnology



www.ofabafrika.org

**Open Forum on Agricultural Biotechnology
in Africa (OFAB)
Kenya Chapter 2015 Report (Vol IX)**

Experiences in sharing knowledge and information on agricultural biotechnology

Published by:

International Service for the Acquisition of Agri-biotech Applications.

Copyright:

African Agricultural Technology Foundation (AATF) and International Service for the Acquisition of Agri-biotech Applications (ISAAA) *AfriCenter* 2016. All rights reserved. Whereas ISAAA *AfriCenter* encourages the global sharing of information contained in OFAB Kenya Chapter 2015 Report, no part of this publication may be reproduced in any form or by any means electronically, mechanically, by photocopying, recording or otherwise without the permission of the copyright owners. Reproduction of this publication, or parts thereof, for educational and non-commercial purposes is encouraged with due acknowledgement, subsequent to permission being granted by AATF and ISAAA *AfriCenter*.

Citation:

Karembu M., Nguthi F. and Chege P. 2016. Experiences in sharing knowledge and information on agricultural biotechnology: 2015 report. African Agricultural Technology Foundation and International Service for the Acquisition of Agri-biotech Applications, Nairobi Kenya.

ISBN:

978-9966-1748-5-7

The views and opinions expressed in this report are those of the guest speakers and do not necessarily reflect the official policy or position of the institutions managing OFAB.

Contacts:

For more information about the publisher, please contact us at:

ISAAA *AfriCenter*,
ILRI Campus, Old Naivasha Road,
P.O. Box 70-00605, Nairobi, Kenya.
Tel: + 254 20 4223618

Email: africenter@isaaa.org,

Website: www.africenter.isaaa.org

E-copy:

E-copy available on www.africenter.isaaa.org or by email at africenter@isaaa.org.

Contents

Acronyms	2
Executive Summary	3
OFAB 79 – February 26, 2015	6
OFAB 80 – June 11, 2015	10
OFAB 81 – December 10, 2015	14
OFAB County Events	20
Central and Eastern Kenya Regions OFAB Event in Embu County	21
Coastal Region OFAB Event in Kilifi County	25
South Rift Region OFAB Event in Kericho County	27
North Rift Region OFAB Event in Uasin Gishu County	30
Western Kenya Region OFAB Event in Busia County	32
Special OFAB Engagements	35
Feedback from OFAB County Events	42
OFAB Kenya Programming Committee Members	52

Acronyms

AATF	African Agricultural Technology Foundation
ABSF	African Biotechnology Stakeholders Forum
CGA	Cereal Growers Association
COMESA	Common Market for Eastern and Southern Africa
EMBRAPA	Brazilian Agricultural Research Corporation
ICOSEED	Integrated Community Organization for Sustainable Empowerment and Education for Development
IFPRI	International Food Policy Research Institute
ISAAA	International Service for the Acquisition of Agri-biotech Applications
MESHA	Media for Environment, Science, Health and Agriculture
NACOSTI	National Commission for Science, Technology and Innovation
NHAC	New Halfa Agricultural Corporation
PARC	Pesticides and Agricultural Resource Centre
PBS	Program for Biosafety Systems
VIRCA	Virus Resistant Cassava for Africa
WEMA	Water Efficient Maize for Africa

Executive Summary

2015 was yet another exciting year for the Open Forum on Agricultural Biotechnology in Kenya (OFAB-Kenya), which is one of the eight OFAB-Africa chapters. The chapter conducted awareness creation in three broad categories. These were activities at county level, quarterly luncheons focusing on topical issues and special sessions for specific groups. The county fora that reached over 400 people were held in Busia, Embu, Kericho, Kilifi and Uasin Gishu Counties. The meetings addressed specific aspects of agricultural biotechnology that would be relevant in the agricultural zones surrounding the host counties. Additionally, they provided an opportunity for participants to present their concerns to departments of agriculture in their county governments. Since agriculture in Kenya is a devolved function, it is the duty of county governments to prioritize agricultural developments including technology adoption for their citizens. Agricultural biotechnology awareness creation activities in counties are thus a high priority for OFAB-K.

The three quarterly luncheons held in the year focused on topical issues including the 2012 GM foods imports ban, agri-biotech and biosafety status and capacity in Kenya and the launch of the global report on commercialized biotech/GM crops: 2014. The events updated participants on global trends of biotech crops and the benefits accruing from the same. Kenya's roadmap to commercialization was also discussed. While the country has made tremendous progress developing the requisite capacity and an enabling regulatory environment for research and adoption of GM crops, it is yet to commercialize. Challenges such as the ban on GM foods importation, lack of a GM product on the ground, and misinformation leading to fear of GM crops are the main obstacles to commercialization.

Capitalizing on opportunities to address these challenges and other short term emerging issues throughout the year, the chapter held special meetings with specific interest groups. Partnerships with county governments, local NGOs, universities and public research institutions were key in organizing biotech information sharing fora. The chapter also benefitted from a pool of science journalists who sustained agricultural biotechnology as a public agenda item in the media.

Notable outcomes of the awareness creation activities were the increased voices of different stakeholders calling on the government to lift the ban on GM foods importation. Additionally the chapter created awareness and led outreach efforts towards specific short term goals. This included the call for public comments by the National Biosafety Authority (NBA) during the applications for environmental release of insect resistant cotton and maize. Policy makers including Governors, Members of Parliament and County Executives of Agriculture are among the stakeholders that participated in the various OFAB awareness creation activities.

The chapter would not have achieved the year's activities without valuable and consistent inputs from members of the chapter's Programming Committee. The secretariat is grateful for the invaluable support from partners: the African Agricultural Technology Foundation (AATF), the Program for Biosafety Systems (PBS) and the National Commission for Science, Technology and Innovation (NACOSTI), among others.

OFAB Annual Planning and Review Meeting

OFAB Kenya hosted the 2015/2016 OFAB -Africa review and planning meeting in Nairobi, Kenya on the 15th and 16th of April 2015. The meeting brought together 8 OFAB chapters from Burkina Faso, Ethiopia, Ghana, Kenya, Nigeria, Tanzania, Uganda and Zimbabwe. In attendance were Dr. Dennis Kyetere, the Executive Director, African Agricultural Technology Foundation (AATF), Mr. Brantley Browning of Bill and Melinda Gates Foundation (BMGF) and Prof. Sarah Davidson from Cornell Alliance for Science. The meeting is held each year

to review OFAB's activities in the different countries, derive impacts, lessons and also share experiences.

All the chapters reported the activities they had undertaken, lessons learned, and the way forward. They also agreed on the themes for the third phase of OFAB as: **Improving policy environment; increasing product demand; and better issues' management.** The chapters were called upon to reach out to the grassroots through a model presented by Cornell Alliance for Science, referred to as the 'Snowflake model. This ensures that information trickles down to the grassroots through volunteer informants' mobilization strategy.



Participants of the 2015/2016 OFAB planning and review meeting in Nairobi



Quarterly OFAB Events



1

OFAB 79 – February 26, 2015
Launch of 2014 Report on Global Status of Commercialized Biotech/GM Crops: ISAAA Brief 49



Dr. Margaret Karembu
Director, ISAAA AfriCenter

Presenter's Profile

Dr. Margaret Karembu is the Director of ISAAA AfriCenter and Chair of OFAB Kenya chapter Programming Committee. She is actively involved in various capacity strengthening initiatives for biosafety communication and policy outreach in Africa. She holds a PhD degree in Environmental Science Education from Kenyatta University.

Introduction

The population in Africa, which currently stands at 1.1 billion, is projected to reach 4 billion in 2100. It is therefore prudent to plan on where the food to sustain this population will come from. By 2050, Africa must double her food production, even with fewer resources. The challenge is more vivid taking into account that 65% of Africa's workforce is employed in agriculture. The sector is characterized by ageing farmers as youths are shunning agriculture for white collar jobs.

While maintaining the focus on increasing food production, there are numerous challenges that will have to be overcome. This will require modern technologies such as agricultural biotechnology to be combined with other tools including plant breeding, conservation tillage, Integrated Pest Management (IPM), sustainable resource management, variety selection, organic farming and utilization of indigenous knowledge. Although agricultural biotechnology has demonstrated substantive benefits in improving crop production, it does not replace traditional agriculture. It is a tool that complements the existing technologies.

Global Status on Commercialized Biotech Crops in 2014

2014 was the 19th year (1996-2014) of commercialization of biotech crops. According to James (2014), 181.5 million hectares of biotech crops were planted. This is more than a 100 times the number of

hectares (1.7 million) planted at the beginning of commercialization in 1996. A record 18 million farmers in 28 countries planted biotech crops in the year, marking a sustained increase of 3 to 4% or 6.3 million hectares (~16 million acres) compared to 2013. Out of the 28 countries that grew biotech crops, 20 were developing economies, and 8 were industrialized countries. Importantly, compared to 2013 data, one new country, Bangladesh, joined the league of countries with GM crops. The country approved the insect resistant eggplant (Bt Brinjal), also referred to as 'queen of vegetables' for commercialization. The Bangladeshi government demonstrated strong political good will by greatly reducing the period between approval and actual planting by farmers.

Developing countries planted ~11 million hectares more than the area planted by industrial countries (96 million hectares against 85 million hectares). More than 16 million farmers of the 18 million who planted the crops were resource poor, mainly from Asia (majority being from China and India). Biotech crop traits planted in the year were herbicide tolerance (99.4 million hectares), insect resistance (28.8 million hectares) and stacked trait- herbicide tolerance and insect resistance (47.1 million hectares).

In Africa, calls to embrace science, technology and innovation intensified. Biotech tools featured prominently and momentum in growing of the crops was maintained. Three countries- Burkina Faso,

South Africa and Sudan continued taking the lead in commercialization of biotech cotton, maize and soybean. In South Africa, the total biotech crop area was 2.7 million hectares. The hectareage for biotech maize, soybean and cotton in the country was 2.15 million, 600,000 and 9,000 respectively. Burkina Faso recorded a 5% increase in adoption of Bt cotton, to grow the crop on a total of 454, 124 hectares. Sudan planted Bt cotton on a total of 90,000 hectares, a 46 % increase in adoption from 2013.

Confined field trials of biotech crops continued in seven African countries namely Cameroon, Egypt, Ghana, Kenya, Malawi, Nigeria and Uganda. The key crops at various stages of trial include banana, cassava, cotton, cowpea, maize, rice, sorghum, sweet potato and wheat. The on-going trials focus on traits of high relevance to challenges facing Africa, key among them drought, nitrogen use efficiency, salt tolerance, nutritional enhancement as well as resistance to tropical pests and diseases.

The economic benefits realized from growing biotech crops globally were US\$20.4 billion of which US\$10.1 billion was for developing and US\$10.3 billion was for industrial countries. Additionally, over the last 20 years, GM technology adoption has reduced chemical pesticide use by 37%, increased crop yields by 22% and increased farmer profits by 68%. Biotech crops adoption has also contributed to a better environment by saving ~500 million kg a.i. of pesticides and reducing CO2 emissions by 28 billion kg, equivalent to taking 12.4 million cars off the road for one year.

Remarks from other Speakers at the Event

Several speakers shared important lessons learnt while interacting with various stakeholders involved in agri-biotechnology.

Hon. (Dr) Robert Pukose, MP for Endeless Constituency and Vice-Chairman of the Parliamentary Committee on Health

Hon. Robert Pukose, MP for Endeless Constituency shared his European biotech study tour experience, highlighting reasons why Kenya should lift the ban on GM foods importation. Scientists must strive to communicate to the ordinary Kenyan, because the biggest challenge facing GM foods acceptance is misinformation. It is disheartening that Kenya is starving while there are technologies that can adequately address this problem.

Contrary to the belief that Europe does not accept GMOs, European farmers are benefiting from GM crops. As an example, the stalkborer challenge that had devastated maize farming in Spain was addressed with the adoption of a biotech maize, which is resistant to the pest. As a result, Spain has increased its maize crop for the benefit of its farmers and the country at large. The ban on GM foods importation that has persisted in Kenya since November 2012 is therefore unnecessary because it was based on a flawed scientific publication. The GM technology needs to be utilized to solve the problems affecting food production in Kenya.



Hon Dr. Robert Pukose flanked by AfriCenter director Dr. Margaret Karembu address members of the press shortly after Brief 49 launch

Dr. Richard Oduor - Chairman, Kenya University Biotechnology Consortium (KUBICO)

Dr. Oduor, a scientist at Kenyatta University expounded on Kenya's capacity for agri-biotech research and regulation. Highlights included adequacy of research facilities, regulatory platforms, and the human capacity needed to develop biotech products. Research institutions including Kenyatta University Plant Transformation Lab (PTL) and Kenya Agricultural and Livestock Research Organization (KALRO) have highly trained personnel in genetic modification technology. The country's Biosafety Act 2009, which ensures responsible research and minimizes risks that may be posed by GMO products is an indication that the government is in support of the technology.



KUBICO chairman, Dr. Richard Oduor addresses members of the press

Issues raised

Question: Since the Deputy President has said that we have to adopt the technology and scientists have done their part, who stands in the way of the technology reaching the farmers? Can parliament do its part in ensuring that the technology reaches the farmers?

Response: The participants were assured that the issue would be raised in parliament urging the government to lift the ban.

Question: When will the insect resistant (Bt) cotton be available to farmers for planting?

Response: The Bt cotton project has completed research on the crop and applied for environmental release to the NBA. Once approval is given, the government will involve all stakeholders so that they can participate in delivery and adoption of the technology for the benefit of Kenyans.



2

OFAB 80 – June 11, 2015

Launch of Report on the Status of Biotechnology in Kenya under 'Next Harvest II: Agricultural Biotechnology Capacity and Development in Africa Project'



Dr. Virginia Kimani



Ms. Patricia Zambrano

Presenters' Profiles

Dr. Virginia Kimani is the Director and Lead Consultant of the Pesticides and Agricultural Resource Centre (PARC). She is an agriculturist and an expert in pesticides and crop protection. She holds a PhD in Crop Science from University of Nairobi. **Ms. Patricia Zambrano** is a researcher at the International Food Policy Research Institute (IFPRI). She holds an M.A. in Economics from University of California, Davis.

The Next Harvest II: Status of Biotechnology in Kenya

The June 2015 event offered a platform for the launch of a report on the status of biotechnology in Kenya under the 'Next Harvest II: Agricultural Biotechnology Capacity and Development in Africa' project. The study, which was completed in 2012 sought to establish the biotechnology capacity in Africa and provided recommendations going forward. It focused on the agricultural biotechnology components including: public and private institutions involved; main agri-biotech research activities being carried out; human and financial resources employed; techniques and methods used; characteristics of current policies, constraints and opportunities. Data was collected from researchers in international research institutions, regional organizations in Kenya, universities and national research and policy institutions.

The study found out that the current legislation mainly focuses on crop biotech research leaving out livestock, forest and fish biotechnology.



A participant contributing to discussions during the meeting

Additionally, there are limited incentives to retain human capital for biotech. The study identified a lack of targeted biotechnology strategy with a clearly defined objective system to identify, fund and sustain priority products as a major hurdle. Another important finding was that Kenya is selective in importation of biotechnology because whereas the country imports GMO derived medicine such as insulin, the ban on GM food imports remain in place. Moreover, while the country has a regulatory framework, there appears to be contradiction in its application because of the ban.

Nevertheless, the study identified some opportunities for agri-biotech research as follows:

1. There is a clear demand for new products to mitigate climate change impacts such as drought, and emerging challenges such as Maize Lethal Necrotic Disease. New biotech products are required to meet food and nutritional requirements of an increasing population.
2. The lessons learnt in the development and deployment of tissue culture banana could be used in the overall research and development of GM crops and products.
3. There is an overall increase in the number of trained personnel in biotechnology.

The study gave various recommendations:

1. There is need for the government to commit more funding especially for products of national and regional interest.
2. Incentives are necessary to boost private sector investment in agri-biotech such as reduced taxes on equipment for diagnostics and basic service delivery.
3. Efforts are needed to build gender balance that would result in increased participation of women in agri-biotech research and development.

The project compared the agri-biotech capacities of Kenya, Nigeria, Uganda and South Africa, taking into account their diverse stages of agricultural biotechnology development, the size of the sector in the countries and the potential to draw lessons from their varied experiences. Crop research was the most prominent in agricultural biotechnology in the four countries followed by livestock and fisheries, forestry and ornamentals and microbes research in that order. All the countries had crop, livestock and fisheries biotechnology research while forestry and ornamentals, and, microbes biotechnology research was only present in Kenya, Nigeria and South Africa.

Nigeria had a higher number of PhD, Master's and BSc degree holders in agricultural biotechnology followed by Uganda and Kenya respectively. South Africa had the highest spending in agricultural biotechnology research at 0.9% of GDP followed by Kenya at 0.11%, Uganda at 0.088% and finally Nigeria at 0.005%. Compared to Nigeria and Uganda, Kenya had the highest number of research activities in tissue culture, molecular markers, recombinant DNA technology and genetic transformation (Table 1).

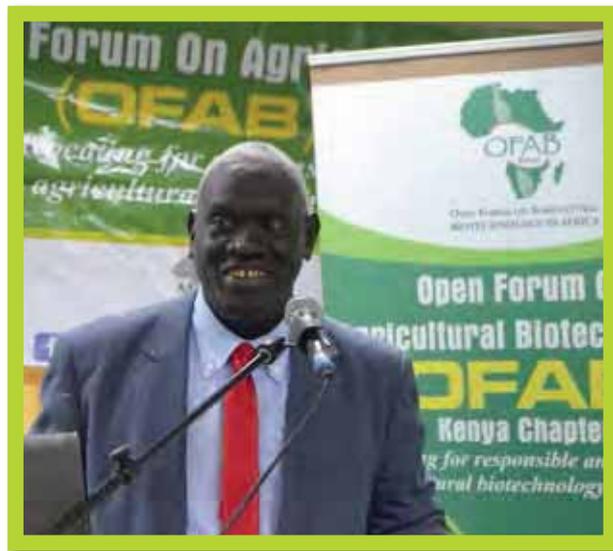
Table 1: Comparison of the number of research projects in three of the four countries under study.

Technique/ product	Kenya	Nigeria	Uganda	Total
Tissue Culture	34	12	15	61
Crop	22	12	15	49
Non-crop	12	0	0	12
Molecular Markers	27	19	10	55
Crop	21	12	9	42
Non-crop	6	7	1	14
Recombinant DNA	12	9	9	30
Crop	8	7	9	24
Non-crop	4	2	0	6
Genetic Transformation	13	8	15	36
Crop	12	7	15	34
Non-crop	1	1	0	2

Source: <http://www.slideshare.net/JoseFalck/next-harvest-ii-presentation-kampala-june-2015>

Remarks by Dr. Moses Rugutt, Director General, NACOSTI

Kenya has made significant progress in agri-biotechnology and biosafety, by enacting the Biosafety Act, 2009 and putting in place the National Biosafety Authority (NBA). This highlights the Government of Kenya's commitment to science and technology development. The government may soon establish a Research Fund Authority to ensure that progress in research is sustained. Although the ban on importation of GM foods is still in place, consultations within government are on-going to get it lifted. Similarly progress is being made to ensure adoption of other emerging technologies. For instance, the government is in the process of formulating a policy on nanotechnology. The commission is also developing a bioscience policy and bill.



Dr. Moses Rugutt, DG NACOSTI, addressing participants during the meeting

Issues raised

Question: In the Harvest II study, how many non-scientists were involved?

Response: The project targeted technical information and therefore did not involve non-scientists.

Question: How is the government involved in agri-biotech and biosafety awareness creation?

Response: The government is actively involved in agri-biotech awareness creation through the BioWARE program of NACOSTI. In addition, the Council of Governors is spearheading the National County Biotechnology Stakeholders' Forum, which will endeavor to create biotechnology outreach and awareness in the counties.



3

OFAB 81 – December 10, 2015

**Experience-sharing Session by Participants of
Study Tours to Brazil, India, South Africa, Sudan and
USA in 2015**

The end of the year OFAB-Kenya event provided a platform for a panel of delegates who participated in ‘seeing is believing’ biotech tours in different parts of the world in 2015 to share their experiences. The objective of the session was to amplify the message to a wider range of stakeholders and to discuss how lessons learnt can be implemented in Kenya.

The event was held within the period that NBA had requested members of the public to provide their comments towards the application for open field cultivation of Bt cotton. Kenya’s Biosafety Act requires Kenyans to provide their comments towards application for environmental release of any GM product that has been submitted to NBA. Thus, participants took this opportunity to provide their comments on the application. They were briefed on the Bt cotton research process in Kenya, that had led to the submission of the application.

The study tour experiences that were shared included:

i. India Study Tour Experience

Hon. Moses Mwanje, the Agricultural County Executive for Busia and Chair, County Executives of Agriculture in Kenya

The India study tour was organized by ISAAA AfriCenter in collaboration with South

Asia Biotechnology Center. There were 30 participants in the tour who included policy makers, regulators, government officials, researchers and consumers. The officials were from six cotton growing countries in Africa: Ethiopia, Kenya, Malawi, Sudan, Swaziland and Zambia

The purpose of the tour was to learn from Indian insect resistant cotton (Bt cotton) hybrid farming experiences. Over 95% of farmers in India grow Bt cotton. They have realized a significant decline in production cost of Bt cotton compared to conventional cotton, owing to the reduction in use of pesticides. Indian farmers reported a threefold yield increase from 302 with conventional cotton to 1200 kgs per hectare with Bt cotton.

Like in Kenya, most farmers in India are smallscale with plots of land ranging from 1 to 1.5 ha. Their adoption of Bt cotton has increased from 0.05% to 95% in 12 years from 2002 to 2014. There is also a strong public-private partnership with the private sector supplying good quality Bt cotton seeds to farmers. Additionally, hybrid seeds development has created employment, especially in rural areas, with women being employed in breeding programmes.



Hon. Moses Mwanje (right) with other panelists at the event

ii. Brazil Study Tour Experience

Prof Dorington Ogoyi- Sharing Experiences from Brazil- Research and Regulating of GM Crops in Brazil

The Brazil study tour was a mentorship exchange involving policy makers, media editors, private-sector players, regulators and farmer leaders. Participants in the tour came from 6 countries: Argentina, Burkina Faso, Kenya, Mozambique, Nigeria and Uganda.

Some of the regulatory issues regarding GM crops were analyzed and compared between Kenya and Brazil as presented in table 2.

Table 2. A comparison between Brazil and Kenya regulatory framework

Area	Kenya	Brazil
Policy	National Biotechnology Policy, 2006	National Biosafety Policy
Biosafety Laws	Biosafety Act, 2009 4 Regulations published in 2011 and 2012.	Brazilian Biosafety Law No. 11.105 of January 2005 9 Normative Resolutions Decrees
National Competent Authority on Biosafety matters	NBA	CTNBio – National Biosafety Technical Commission
National Focal Point	NBA	Ministry of Foreign Affairs
Institutional Committees	IBC	CIBio- Biosafety Internal Commission
Secretariat	NBA Secretariat. Receives applications and does coordination of the review process	CTNBio Secretariat. Receives applications and does coordination of the review process
Technical risk assessment	Expert reviewers and Technical Committee of the Board	CTNBio
Decision making	NBA Board (17 Members) Decision by consensus	CTNBio (27 Members) CNBS – For commercial releases Decision by simple majority
Application fees	Vary depending on application Contained use – Ksh. 170,000 (~USD 1700) Import, Export – Ksh. 25,000 (~USD 250) Environmental release – Ksh. 850,000 (~ USD 8500)	Free

Involvement of other Agencies in the decision making process	Yes; 8 agencies involved i.e. KEPHIS, DVS, DPH, KEBS, NEMA, KWS, KIPI and PCPB	Yes; 4 agencies involved i.e. MAPA, ANVISA, IBAMA and MPA
Appeal mechanisms	Appeals Board established in 2014.	CNBS. Decision is final
Socioeconomic considerations	Mandatory for environmental release. Considered by the NBA Board	Needed for environmental release/ commercial use. Considered only by CNBS
Approvals	Yes, at lab, greenhouse and CFTs. No commercial release yet	Yes, at lab, greenhouse, CFTs and commercial releases of maize, cotton, soybean
Current Status	One of the leader in CFTs in Africa	2nd highest producer of GM crops in the World

iii. USA Cochlan Fellowship Experience

Mrs. Rose Nyanga, Science Advisor at the Ministry of Education, Science & Technology (MoEST)

The fellowship was a two weeks biotechnology regulation immersion course in the US. Participants learned that GM products in the country are generally accepted by majority of farmers, traders and consumers. The country's biotechnology development program employs a system approach that runs from laboratory to the consumer.

The cost of regulating GM crops is quite high. Research has shown that to deregulate a single event can range between US\$ 7 million to US\$ 15 million and with increasing stringent measures, the cost is likely to go higher. There is urgent need to reduce the costs of GMO regulations so that it is undertaken in a cheaper, faster way without compromising on standards. This would make it easier for other players such as public universities and private researchers to release more crops in the market. Despite the fact that GM crops have become almost the norm with farmers in the US, there are strong activist movements such as the Greenpeace movement that

oppose GM crops and propagate myths and misinformation on their safety, especially with consumers.

iv. South Africa Study Tour Experience

Mrs. Beatrice Kariuki, a farmer leader in Nakuru, on her study tour to South Africa

The objective of the South Africa study tour was to build participants' confidence by exposing them to biotech crops and sensitizing them about adoption the crops' adoption by small scale farmers. The participants included Kenyan farmers, regulators and private sector players.

South Africa has commercialized genetically modified maize, soybean and cotton, on 2.7 million hectares of land (as of 2014). According to farmers in areas visited, since they started growing GM cotton, they have increased their production area due to reduced costs of inputs. They progressively moved from Bollgard I to stacked traits of insect resistant and herbicide tolerant cotton. They argued that cotton with the two genes does not require big land for refugia, which maximizes on harvests. Given that their situations are similar, Kenyan farmers can benefit from the technology.

v. USA Alliance for Science Global Leadership Course in Cornell University

Mr Kennedy Oyugi, Deputy Program Officer, African Biotechnology Stakeholders Forum (ABSF)

The Cornell Alliance for Science global leadership course was aimed at equipping participants with an integrative approach, foundational skills and practical tools to run successful advocacy efforts in their local context.

The 25 participants were drawn from 10 countries from around the world but mainly from Africa.

Lessons learnt:

In order to organize a successful grassroots campaign, the following ingredients are important:

- Empowerment Organizing: It is important to be organized before engaging with grass root leaders. Communities should be incorporated in efforts to advocate for change. One of the effective modes of organization that can be used is the snowflake model. The model solves organizational problems by creating a system in which members of the team have shared responsibility for a common goal, but work independently toward achieving their own components. One person doesn't need to carry all of the weight. As teams grow, the snowflake changes to incorporate new people.

Organizing structure

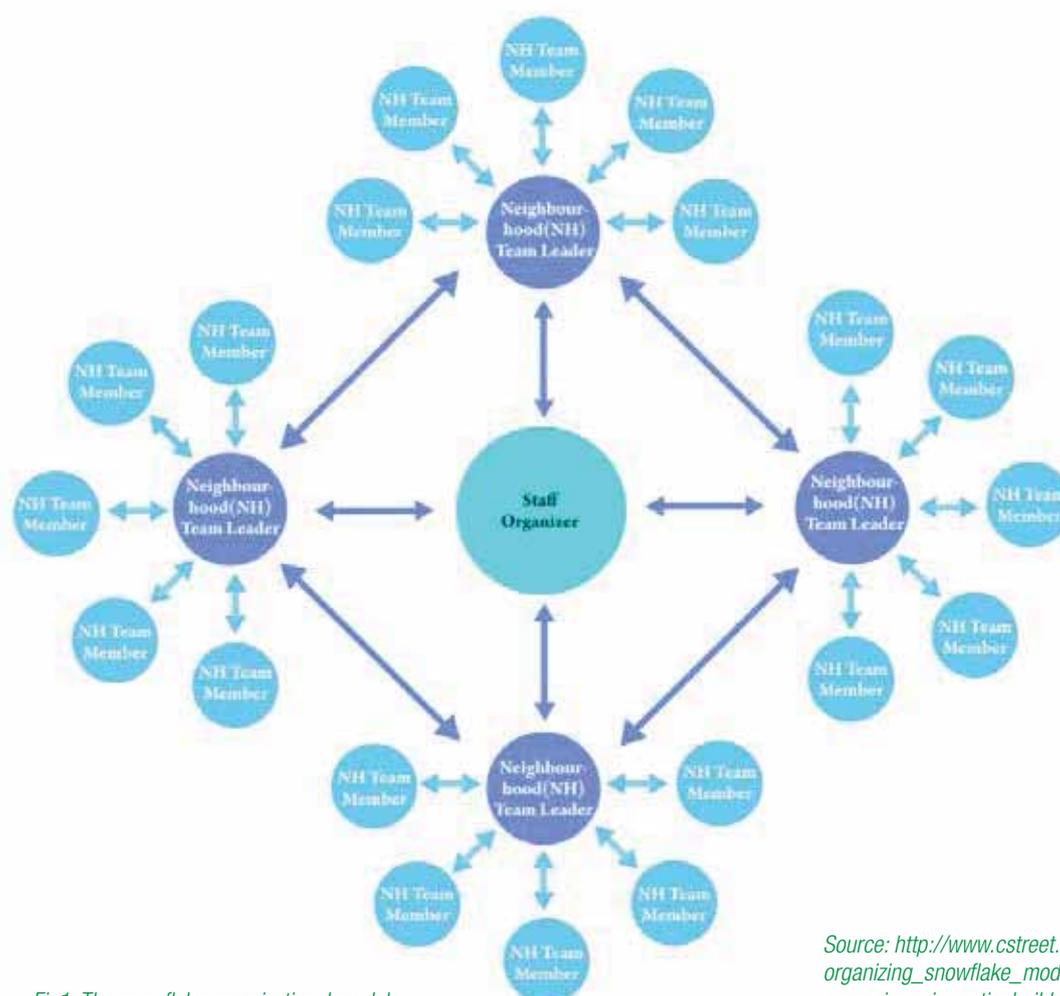


Fig1. The snowflake organizational model

Source: http://www.cstreet.ca/organizing_snowflake_model_campaigns_in_nationbuilder

- **Training partners:** It is important to identify and train people who will work with teams for successful integrated, grassroots campaigns. Training could be teaching on the science behind biotech crops and biosafety matters to principles of science communication and advocacy methods.
- **Data Analysis:** Participants learned how to develop a data-driven culture and implement data-driven decision making.
- **Communications:** Participants learnt the fundamentals of storytelling and message amplification on the ground, online, and via the press. Notably scientists ought to make deliberate efforts to ensure they involve end users of their technological innovations throughout the product development. It is not enough for them to develop technologies; they also need to explain their work to local communities in the most simplified manner. They also need to ensure their messages address the belief and value system of end-users.

vi. Sudan Field Visit Experience

Paul Chege, Program Officer, ISAAA

The Sudan study tour participants included regulators, scientists, journalists and regional economic blocks representatives from COMESA countries.

The visit was meant to provide an experiential learning for COMESA countries, since the country is first among COMESA member states to commercialize biotech cotton. The country begun cultivating insect resistant cotton in 2012 on 20,000 hectares and by 2015, the hectarage increased to 120,000 hectares.

According to farmers who were visited in the irrigated cotton areas of New Halfa Agricultural Corporation (NHAC) and Rahad Scheme, Bt cotton has been satisfactory in tackling the African boll worm menace and in effect, increased their yields and improved cotton quality. With Bt cotton, the farmers spray 2 times instead of the 8 or more times they used to spray with conventional cotton. Besides saving on the cost of fuel and the insecticides, they have saved substantial time. They use this time to maximize on other agronomical requirements of Bt cotton such as irrigation as well as attend to other crops and livestock. This has contributed to the increase in yield from about 1.8 tonnes/ha with conventional cotton to 6 tonnes/ha for Bt cotton.

Issues raised

Question: How do participants of the visits amplify the benefits of the technology to Kenyans?

Response: The participants should first inform the community leaders i.e. county governors and county executives of agriculture, use these messages in public forums such as the OFAB session that was convened in Busia County, Western Kenya. They should request governors to use this information to demand for the technology on behalf of farmers.

Question: Can anyone assure us that Bt maize can resist aflatoxin infestation?

Response: GM maize can contribute to controlling aflatoxin because it is not affected by stalk borer, a pest which perforates the maize and gives an entry point to mycotoxins in the fields. Farmers should be informed that proper drying of maize is critical in reduction of aflatoxin contamination.



OFAB County Events

Central and Eastern Kenya Regions OFAB Event held in Embu County on February 5, 2015



Participants of Embu County OFAB

The event was organized in partnership with Embu University College, ICOSEED and the County Government of Embu. The objective of the meeting was to facilitate interaction among agricultural biotechnology stakeholders including scientists, policy makers, regulators and communicators. Participants discussed the state of cotton sub-sector in the country. The event also offered an opportunity to better understand end users' perceptions on the technology. The guest of honour, Dorothy Nditi, Deputy Governor, Embu county emphasized the need for emerging technologies such as Bt cotton to revive the cotton sub-sector and improve farmers' livelihoods.



Prof. Eucharika Kenya- Deputy Principal, Embu University College welcoming participants to the institution during the meeting

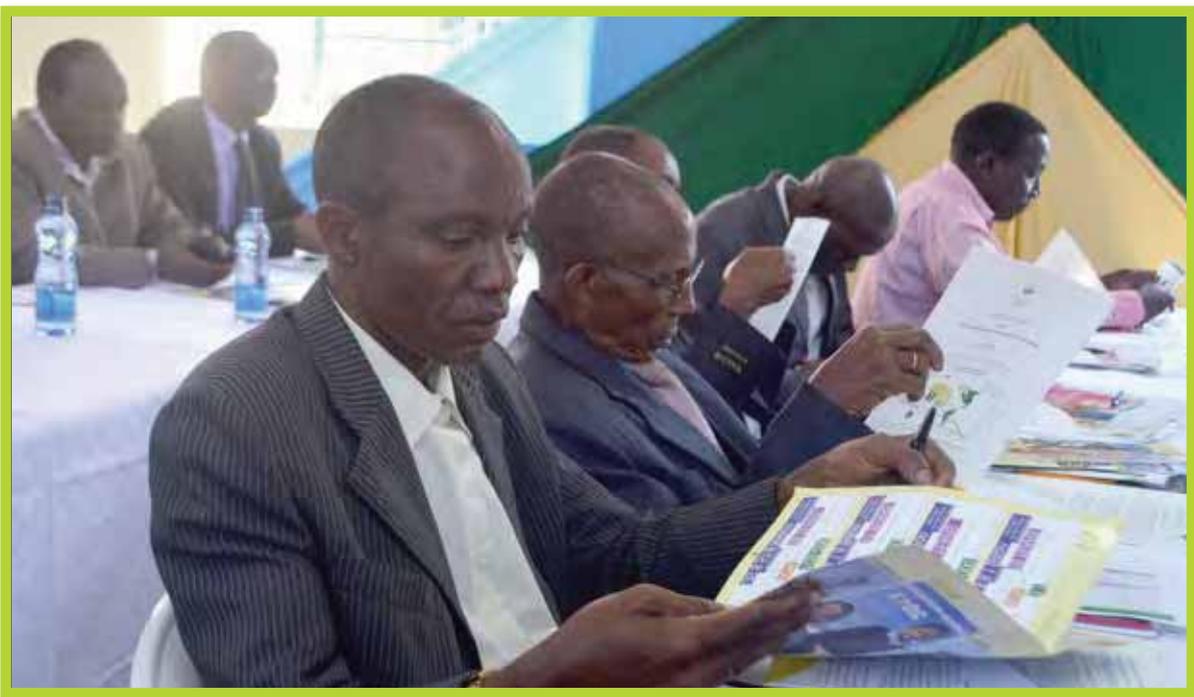
Speakers at the Forum:

i. Dr. Charles Waturu- Status of Bt Cotton Research in Kenya- (Dr. Waturu is the Bt cotton project P.I. at KALRO)

Participants were informed that three African countries namely Burkina Faso, Sudan and South Africa had adopted biotech crops and were already realizing benefits from growing them. KALRO has completed confined field trials with insect resistant (Bt) cotton and is ready to conduct National Performance Trials (NPTs) when approval is granted. One variety from the Bt cotton project, 06Z604D, that can be advanced to commercialization, has been identified.

Kenyan cotton yields continue to be low with the highest recorded production being 70 000 bales in 1985. The main challenge of cotton farming in the country is pests infestation reducing the average harvest of cotton lint and seed to 250 kg/ha and 572 Kg/ha respectively compared to a potential of about 1000 kg/ha cotton lint and 2500 kg/ha cotton seed.

The conventionally bred cotton that Kenyan farmers are growing is susceptible to a host of sucking and chewing pests, key among them, cotton bollworms. Other pests include cotton stainer, cotton aphids and red spider mites. Pest control takes 32 % of all production costs. Notably, bollworms destroy the whole cotton boll leading to almost zero yields. This challenge can be addressed by using Bt cotton, a product of genetic engineering, that is resistant to bollworms. Planting Bt cotton not only ensures that bollworms get eliminated, but also reduces the use of pesticide sprays and thus conserves the natural enemies of red spider mites. These mites cause massive defoliation of cotton. The other constraints to cotton production include inadequate cotton seeds, high cost of inputs, inefficient agronomic management skills and poor pests and diseases management.



Participants follow proceedings during the event

ii. Kenya's Biosafety Framework by Prof. Theophilus Muthui – *(Prof. Muthui, is the Chief Biosafety Officer at National Biosafety Authority (NBA).)*

The Biosafety Act 2009 created the Kenya National Biosafety Authority which is mandated with general supervision and control over the transfer, handling and use of genetically modified organisms (GMOs). The authority works in partnership with other institutions all of which endeavour to ensure safety of biotech products developed or introduced. Among the products whose research the authority has regulated is Bt cotton, which has gone through all the necessary steps towards commercialization. The crop is awaiting approval for environmental release.

iii. Overview of the Cotton Sector in Kenya by Mr. Anthony Muriithi- *(Mr. Muriithi is the Interim Head of the Fiber Crops Directorate in the Ministry of Agriculture, Livestock and Fisheries)*

Cotton was the major crop of export at the port of Mombasa in 1940s. The situation has changed over time due to dismal production of the crop. The main challenges have been high costs of insecticides and lack of improved seed. This has led to closure of ginneries and today, only 8 out of the 22 ginneries in the country are working. The operating ginneries are running at 17-31 % of their capacity and are using outdated equipment, making them internationally uncompetitive. It is important therefore, to

have improved planting material to ensure the recovery of the cotton industry. Insect resistant (Bt) cotton whose research is now complete promises to reduce the amount of pesticides used, thus reducing the cost of production, which will go a long way in reviving production.

Reviving the cotton industry will ensure that Kenyans afford clothes and create jobs for the youth. Optimal cotton production will ensure steady supply of raw material, thus meeting the AGOA quarter. If the country does not adopt the technology, other countries such as China and India will continue to export cotton fabric to Kenya for processing.

iv. Status of Mwea Ginnery by Mr. Mugo Makanga- *(Mr. Mugo is the Director, Mwea Ginnery)*

The ginnery was privatized after it collapsed, like many others in the country. Although the ginnery is operational, it does so under difficult circumstances due to lack of raw materials. Cotton production in regions close to the ginnery at the moment is 200 kg/ha cotton lint owing to pest damage, poor seed quality and poor agronomic management. These conditions notwithstanding, the ginnery has put effort in reviving the cotton sector in the region. Returns to farmers have been dismal. These farmers look forward to the commercialization of Bt cotton, so that like their counterparts in Burkina Faso, South Africa and Sudan, they too can increase harvests and lower production costs.

Outcome

i. Quotes by farmers demanding for Bt cotton

“Over the last 50 years, we have been planting cotton, although the yields have been decreasing every year. The reduction has been occasioned by poor quality seed. Further the cotton market has deteriorated and is largely unregulated, which has become a discouragement to farmers. The government must lift the ban on GM foods importation. You cannot stand in the way of change: We must adopt the Bt cotton.” *Mr. Joseph Pamba- A cotton farmer from Mbeere Sub County.*

“We are ready to adopt any technology that will increase our income, reduce post-harvest losses, safeguard our health.” *Mr. Daniel Mugo Magondi- A cotton farmer from Embu County*

“The farmers are ready to listen to scientists and regulators. Cotton farming is going down because farmers have not worked hand in hand with scientists previously. There are no extension staff to inform and motivate farmers to grow the crop. Cotton is a crop that thrives even when others have failed due to drought and farmers should be encouraged to grow it in the arid areas.” *Mr. Joseph Thiga- A cotton farmer from Kirinyaga County*

“I would like to see the adoption of Bt cotton, because I have realized that the produce is of higher quality. We are ready to plant the cotton. Adoption of Bt cotton will contribute to reviving the economy and will provide a turn-around in farmers' income.” *Mr. Gregory Kaburu Ntoburia- A cotton farmer from Meru County*

“We petition the government to lift the ban on GM crops and impose a ban on second hand clothes instead.” *Mr. Peter Njeru- A cotton farmer from Embu County*

“The time has come to stand and shout that we want the Bt cotton.” *Mr. Matthew Kerea- A cotton farmer from Meru County*

“Scientists have done their part, now we want Bt cotton immediately. We need to be trained on the technology.” *Ms. Goretta Musau - A cotton farmer from Makueni County*

ii. Communiqué by Farmers

Twenty nine farmers in the meeting signed a communiqué to the President requesting him to lift the ban on GM foods importation that continue to be a major stumbling block to the adoption of Bt cotton in Kenya ([Annex 1](#)).

Coastal Region OFAB Event held in Kilifi County on July 9, 2015

The event was organized in partnership with Program for Biosafety Systems (PBS), KALRO Mtwapa and Kilifi County Government. The forum provided a platform for cassava and maize farmers from the coastal region to interact with scientists and policy makers through sharing of knowledge and experiences on agricultural biotechnology. The participants who included 17 farmers and 20 county governments' representatives were drawn from Kilifi County and the larger coastal region.

The meeting focused on the status of agri-biotech research in the country and in Kilifi region. A presentation on the Virus Resistant Cassava for Africa (VIRCA) project was made, which generated a vibrant discussion. Cassava is one of the important food crops in the region.

The guest of honour, Mwalimu Menza, County Executive for Agriculture, Kilifi represented the Governor, H.E. Amason Kingi. The county government endeavours to prioritize farmer's concerns and will embrace technologies that will tackle pest and disease problems for farmers, reduce cost of production and increase yield. Biotech crops have helped address these challenges in countries that have commercialized them. Therefore the county government looks forward to commercialization of biotech crops so that Kilifi famers too can benefit.



Participants at the Kilifi OFAB County event

Issues raised

Question: Is there sufficient market for cassava taking into account public fear of cyanide poisoning?

Response: The demand for cassava as food is indeed high. If farmers could collect their produce through Community Based groups (CBOs), they would supply enough to meet the market demand. The county government will educate the population progressively about how to avoid cyanide poisoning.

Question: Can GM cassava cuttings be replanted?

Response: The planting process for both conventional and GM cassava is the same. Therefore it can be replanted. Indeed GM seeds from other crops can be replanted too. However, like in hybrid maize, farmers are advised to plant new seed each season to reap the benefits of hybrid vigour.

Question: How are we going to market our products if we adopt GM cassava since the European Union is against GMOs?

Response: The main reason for cassava improvement in Kenya is food security. Further, the crop is not one of Kenya's export crops. Nevertheless, EU is not against GMOs contrary to the public perception. They know the importance of the technology and have invested in developing such crops. Europe imports huge consignments of GM products. Notably, Europe has sufficient food and therefore the technology they seek is not one to increase or safeguard food production but to suit their dynamic lifestyle demands. They are also leading in GM pharmaceuticals. Strong activism against the technology has however barred commercialization of the technology in most countries with effects of the activism reaching some African countries.

Question: When will the Water Efficient Maize for Africa be commercialized?

Response: The commercialization date for the Water Efficient Maize for Africa (WEMA) in Kenya has been set for 2017 subject to regulatory approvals. Meanwhile, the conventional hybrids with the brand name Drought Tego under the WEMA project have been released to farmers in eastern and western Kenya.

Outcome

At the end of the meeting, 15 farmers signed a petition asking the President to lift the ban on GM foods imports. Acknowledging the potential of the GM technology to improve farm yields, they demanded that the ban on importation of GM foods be lifted in order to facilitate commercialization of genetically modified crops, for improving food security, their social welfare and competitiveness.

South Rift Region OFAB Event held in Kericho County on September 2, 2015

The Kericho County forum was organized in partnership with Cereal Growers Association (a membership association that brings together farmers and educates them on new emerging technologies) and, Kenya University Biotechnology Consortium (KUBICO). The forum had been organized to share knowledge on agricultural biotechnology with young farmers and university students from the South Rift region. It was attended by students from six universities, the county youth government led by their president and farmers comprising of 17 women and 79 men.

Participants were enlightened on the process of genetic modification and the trends in adoption of biotech crops nationally, regionally and globally. Kenya's capacity to develop GM technology was also highlighted with emphasis on the growing number of institutions undertaking genetic transformation work as well as the increasing number of scientists in the field. Detailed information on food and feed safety of biotech crops was also provided.

Special guests' remarks:

1. H.E. Prof. Paul Chepkwony- County Governor, Kericho County

In his welcoming speech, the governor informed participants that GM technology has been vastly used across the developing countries. The technology will be beneficial to Kenyan farmers, but they must be provided with factual information that will help them to make informed decisions. Details on the importance of incorporating new genes into a crop and about safety of the technology to people need to be given.

With the rising food security challenges in Africa, GM technology is one of the best solutions. The main problem in Kenya is that the youth are not embracing the technology and are shunning farming in general. The county is planning to set up a tissue culture centre which will provide job opportunities for biological science students.



Governor Chepkwony address media at the event

"If GMOs can refill our empty granaries, because diseases such as the Maize Lethal Necrosis Disease have left them empty, then we need them here,"
Governor Chepkwony.

2. Mr. Philip Mason - County Executive for Agriculture, Kericho County

Mr. Mason termed the OFAB forum in Kericho County as timely, since the county is experiencing a decline in food production. The county needs to appreciate and embrace GM technology as an alternative tool for crop improvement. Farmers need to get the information and make informed decisions, keeping in mind the food needs of the country.

3. Mathew Korir Kipkurui-Youth President, Kericho County

The Youth president appreciated the awareness creation activity on GM technology among the youth in Kericho County. The youth are in support of technologies aimed at achieving food security not only in the county but the country at large. Youthful farmers need to stay focused and learn the facts that scientists and biotechnology stakeholders share so as to make informed decisions on adoption of the technology and clear all misconceptions.

4. Mr. John Wanyama – Journalist, Citizen TV

Mr. Wanyama shared his South Africa biotech study tour experience. GM crops in South Africa were commercialized 18 years ago.

The Bt cotton farmers in the country have realized increased yields, reduction in the cost of production and generally improved standards of living. The savings that farmers have made from reduced insecticide applications and increased harvests have enabled them to improve their lifestyle by taking their children to school, buy homes and farm machinery. Women's drudgery in the farm has also been reduced since they do not have to hand-weed the Bt cotton that has been stacked with a herbicide tolerance gene. In comparison with the Kenyan cotton farmer who is using conventional methods there is a great difference. Kenyan farmers are abandoning cotton farming due to losses incurred through costly insecticide sprays and poor quality crop due to insect damage.

Issues raised

Question: Do regulatory bodies that can control the GM food exist in the country?

Response: The National Biosafety Authority created by the Biosafety Act, 2009 is the regulatory body mandated with general supervision and control over the transfer, handling and use of genetically modified organisms (GMOs). The authority works in partnership with other institutions to ensure safety of biotech products developed or introduced.

Question: How are scientists preparing to prevent the emergence of bioterrorists?

Response: Emergence of bioterrorists is a pertinent issue. The development process of GM crops however, has no connection with bioterrorism. It is a highly regulated process which would not be easily compromised by people with ill intentions.

Question: What was the reason for the ban of the Mon 810 in about 8 European countries?

Response: The bans result from political decisions, contrary to the scientific evidence and against the existing European market approval. In fact, over the years, the European Food Safety Authority (EFSA) has examined each of the scientific publications that member states used to justify their decisions to ban MON810. EFSA has not found any convincing proof that would change its position on the safety or to scientifically justify a legal ban.

Question: Are the following true about GM food?

- **Causes cancer**

Response: Cancer is caused by several factors that are not linked with use of genetically modified foods. Cancer still exists despite the absence of GM foods in Kenya.

- **Fertilizer and irrigation can be an alternative instead of GM technology**

Response: Use of fertilizers and irrigation on improved seeds will produce far much better results because of the benefit of pest resistance.

- **Monsanto seeds are expensive**

Response: The technology has been donated royalty free to AATF by Monsanto in the case of WEMA Bt maize, and therefore the seeds will not attract any additional cost and will be sold at the prevailing market price.

- **Question:** Are there any reported cases of side effects to the patients treated with the Ebola vaccine?

Response: Currently no side effects have been reported.

Outcome

A declaration by the youth was read by Sylvester Kiprono from the University of Kabianga. They expressed support to the Deputy President H.E. William Ruto's promise to lift the ban on GM foods importation, and called on the government to fast-track the process so that jobs can be created ([Annex 2](#)).

The communiqué was signed by 47 youthful farmers in agreement with the declaration.

North Rift Region OFAB Event held in Uasin Gishu County on September 3, 2015

The forum was organized in partnership with CGA, NACOSTI and KUBICO. The objective of the meeting was to share knowledge on agricultural biotechnology with maize farmers from the North Rift counties. It was also meant to highlight benefits that can be realized from using the technology. The meeting was prompted by heightened activism and misinformation that had led to a protest against the technology in the region.

The key highlight of the presentations was the development of WEMA Bt maize, and its potential to address pest and drought menace that hampers optimal maize production in the region. Participants learned that Kenya has the capacity to adopt GM crops and join other countries whose farmers have commercialized the crops globally. The trend on adoption of the crops regionally and globally was also highlighted.

Participants from the region who had visited South Africa on a 'seeing is believing' tour shared their experience especially on Bt maize. Gilbert Arap Bor, one of the farmers who had participated in the tour explained how South African farmers have fully embraced GM technology and the economic benefits they had achieved. They have increased their crop yields 5 fold in 16 years out of using GM seeds.

Remarks by Chief Guests:

1. Dr. Eliud Kireger – Director General, KALRO

The main objective of KALRO is to develop new technologies for farmers to increase yields, reduce pests and diseases and improve livestock husbandry practices. KALRO is spread across the country with 16 institutions, 47 centers and 30 substations.

About 400,000 tons of maize per year are lost due to pest infestation despite use of pesticides. Adopting the GM technology will be of great importance as the plants will be pest resistance thereby increasing the crop yields with no additional costs in terms of pesticides. Additionally the technology has been tested and verified by relevant bodies to be safe for human use. Kenyans should have faith in the technology as well as the trained personnel that are working to ensure that the technology is of benefit to the country. Farmers should have at this point moved from addressing agricultural production challenges using traditional methods that have not been sustainable. They must strive to adopt the new technological innovations.

2. Hon. (Dr) Ambrose Cheruiyot - Uasin Gishu County Executive for Agriculture



Dr Eliud Kireger (KALRO Director General) and Hon. (Dr) Ambrose Cheruiyot, the Agriculture County Executive (left) addressing the media at the meeting

Farmers were encouraged to focus on the key issues discussed at the forum to clear all misconceptions that would affect decision on adoption of GM crops.

"I was reserved with the issue of GM products, but with information from the experts, I believe that GM technology can address food security in the country." A farmer's conclusion at the end of the event.

Issues raised

Question: What can be done to increase cassava yields in Trans Nzoia County?

Response: The main cassava production constraint is cassava brown streak disease (CBSD) and cassava mosaic disease (CMD). KALRO through the Virus Resistant Cassava for Africa (VIRCA) project is developing varieties with resistance to both diseases. Once commercialized, farmers will realize more harvests from the improved crop.

Question: Does genetic modification of maize improve its storability?

Response: The Bt maize is insect protected against stalk borer damage in the field. However, since the integrity of the grain is protected before harvest, it may not be prone to fungal infection during storage.

Question: What is the expected price for the GM seeds?

Response: The Bt technology has been donated royalty free to AATF meaning that the seeds will be available at the prevailing market price.

Question: What are the chances for open pollination between GM and non-GM crops?

Response: The GM crops have been tested for safety as food, feed and to the environment and found to be safe. Proper agronomic practices and stewardship ensures co-existence.

Question: Does consumption of dairy products from a cow that has consumed aflatoxin infested maize cause health problems?

Response: Aflatoxin is a secondary metabolite produced by a fungus (*Aspergillus* sp.) that infects maize. A certain concentration is required in the body for it to cause an infection. High levels of aflatoxins in the feed can be tracked down to the dairy products. Management can be done by avoiding feeding maize with aflatoxin to cows and ensuring the grains are well dried before storage.

Outcome

A declaration was read by a farmer, Mr. Musa Too, on behalf of all the farmers. They supported the Deputy President H.E. William Ruto's promise to have the ban on GM foods importation lifted. They declared that delivery of the technology to farmers would avail quality seeds, therefore a good harvest and an improved livelihood.

Thirty five participants thereafter signed the declaration ([Annex 3](#)).

Western Kenya Region OFAB Event held in Busia County on December 2, 2015

The event was organized following a request by the Busia County Executive for Agriculture, Hon. Moses Mwanje. The forum would provide a platform for delegates who had participated in a 'seeing is believing' biotech tour to India to share their experiences with cotton farmers in the county. Farmers in the region have largely abandoned cotton farming, which was previously the main cash crop due to poor quality varieties that were prone to cotton bollworm resulting to low yields. Unsustainable supply of processing material for ginneries in the area led to collapse of an entire sub-sector. The County Government thus deemed awareness creation on Bt cotton necessary to enlighten farmers on benefits that can be realized from commercialization of the crop.

The forum also came at a time when NBA had called for public comments towards environmental release of Bt cotton in Kenya. It gave an opportunity for the members of the public to give their comments. During the forum, basic information about development of GMOs, benefits of the technology, safety concerns of the products especially when used as feed or food and safety of the products to the environment were addressed. The trends in the adoption of GM crops globally and regionally were also highlighted. The participants were informed about Kenya's capacity to handle and regulate the GM crops.

Remarks by the chief guest

H.E. Sospeter Ojaamong, Governor, Busia County

The governor highlighted the importance of agri-biotechnology and the benefits it has created for farmers in the countries that have commercialized biotech crops. The misconceptions on the technology have come as a result of misinformation spread by those

who oppose it, thus slowing acceptance in Africa. They work on people's psychology to make them refuse biotech crops and yet agri-biotechnology should be at the forefront of the agricultural sector for high yielding and better quality crops. Adoption of agri-biotechnology should be systematic starting from adequate awareness creation on the technology through various means.



The guest of honour at the event, Governor Sospeter Ojaamong

Experiences Shared by the Delegates on India Cotton Field Visit

Each speaker shared three lessons learnt on the following broad areas:

- i. Aspects of social-economic impacts of Bt cotton on Indian farmers
- ii. Extension services in India
- iii. Research on Bt cotton
- iv. Regulation outlook on Bt cotton
- v. Trade with Bt cotton

Based on the lessons learnt, the speakers gave recommendations on the way forward and elaborated on what they had done with information received in the tour on return.

i. Hon. Moses Mwanje- C.E.C Agriculture Busia County- Socio Economic Impact of Bt Cotton Commercialization in India

1. Over 95% of farmers grow Bt cotton.
2. There is significant reduction in cost of production of Bt cotton compared to conventional cotton.
3. The private sector is spearheading seed production e.g. Mahyco, Monsanto who work with farmers to avail seeds.

Recommendations: Bt cotton can revive the cotton sector in Kenya. The private sector should take a lead role in ensuring successful adoption and commercialization.

After the tour: Hon. Mwanje held an interview with Citizen TV (Viewership: 85% of Kenya's viewers) and partnered with ISAAA to hold the Busia OFAB event. As the chair of County Executives (CECs) on Agriculture in the 47 counties in Kenya, he is planning to hold more sensitization meetings in his county and the entire country in partnership with his CEC colleagues.

ii. Dr Dan Kiambi, Alternate Chair, OFAB-Kenya Programming Committee: Regulatory and Research Outlook in India

1. The regulatory system works very well. It is neither too stringent nor too permissive.
2. The Indian government has put in place rules and guidelines for growing, development, importation and environmental release of GM crops. The Ministries of Science and Technology, Agriculture and Forestry work together in monitoring the use and release of Bt cotton.
3. Other scientific committees headed by experts are also involved in evaluation of GM crops before commercialization.

Recommendations: A system whereby the Ministries of Education, Science and Technology, Environment and Natural Resources and Agriculture, Livestock and

Fisheries, work together in monitoring the use and release of Bt cotton needs to be put in place. Institutional Biosafety Committees are efficient means of easing biosafety requirements.

After the tour: Kiambi contributed in the drafting of a detailed report on the tour.

iii. Mr Timothy Ogwang, Officer in Charge, Fibre Crops in State Department of Agriculture: India Bt Cotton Extension Services

1. India has strong extension services provided by private companies, government, universities and research institutions.
2. There is strong collaboration between private and public institutions. Private sector supplies good quality, Bt cotton seeds to farmers.
3. Hybrid seeds development has created employment, especially in rural areas, with women getting jobs in the breeding programs.

Recommendations: To succeed in Bt cotton commercialization, strong public-private partnerships are important.

After the tour: Timothy has produced a report with recommendations and submitted to the State Department of Agriculture.

iv. Mr. Ngari Munene, Assistant Director in the Ministry of Trade and Industrialization: Bt Cotton Impact on Trade

1. Cotton seeds give 4 types of oil (some are medicinal while others are edible).
2. There are two types of seed cake from Bt cotton, one is used as cattle feed and the other as poultry feed.
3. Substantive tests have been conducted to ensure safety of Bt cotton seed for human and animal feed.

Recommendations: Bt cotton is a good candidate for reviving Kenyan cotton sector.

After the tour: Mr. Ngari shared a report with the Ministry of Trade and Industrialization with recommendations on adoption of Bt cotton in the country.

v. Mr. John Wanyama , Journalist, Citizen TV

Mr. Wanyama played a video on his visit to India. The video had been played in prime time news on Citizen TV (with 10 million impressions) several times. See in link: <https://www.youtube.com/watch?v=GOIRZ5Nv8-o&app=desktop>

Issues raised

Question: Can biotechnology help suppress the cassava gene that causes cyanide and add genes that improve vitamins and other nutritional content?

Response: With biotechnology, there are enormous possibilities because specific genes for specific purposes are used. However, research looks at the most challenging issues first. For cassava, so far the priority that KALRO has identified is viral diseases, as a first step. The second phase will address nutritional improvement.

Question: What is Bt cotton's yield potential? Wouldn't a biotech lab around western Nyanza be more appropriate to cater for the needs of cotton growing counties in the region?

Response: Local universities in the western region have biotechnology programs and good laboratories. It would be worthwhile to approach them to help the counties address local problems in crops.

Question: How long is it going to take to get Bt cotton commercialized?

Response: It will depend on the open field cultivation approval by the NBA. Commercialization could take place by 2018. After the confined field trials, an application for environmental release is submitted to the NBA. This has already been done. Once approval is granted for environmental release, the crop will be planted on National Performance Trials (NPTs) in various parts of the country to select the appropriate varieties for specific localities. This will be followed by the variety release process after which the crop will be grown commercially.

Outcome: Remarks and quotes by participants in support of the technology

"We need to put into action what we have learnt. We have seen that our Kenyan colleagues went to India and they are witnesses of the solution to African bollworms." Francis O. Omuse, Farmer, Teso South sub-County.

"I have benefitted from today's training and am asking that these insect resistant varieties be given to us." Consolata Aluoch Ongidi- Farmer, Matayos sub-County.



Hon. Moses Mwanje and Dr. Dan Kiambi answer queries from the media



Special OFAB Engagements

I. Special OFAB in Partnership with CGA on May 7, 2015

The forum provided an opportunity for delegates who participated in a study tour in Brazil to share their experiences with growers/farmers. This was important because farmers as business people are keen on innovations that will allow their ventures to yield more income. The Brazil study tour participants included representatives from Burkina Faso, Kenya, Mozambique, Nigeria, and Uganda. It had been organized by ISAAA AfriCenter, in partnership with the Brazilian Agricultural Research Corporation (EMBRAPA) and the African Biosafety Network of Expertise (ABNE). The Kenyan participants' experience was expected to inspire farmers about a technology that had resulted in high yields, low inputs, quality produce and an improved lifestyle for their counterparts in Brazil.

The participants also benefitted from a presentation about Kenya's biotechnology development agenda. The presentation gave examples of policy statements extracted both from government documents and from senior policy makers' speeches. All the statements portrayed strong support for the use of biotechnology in agriculture. The presentation sought to inform farmers that the government recognized the role biotechnology can play in poverty reduction, enhancing food security, and in the conservation of biodiversity and the environment. It also pointed out the central role that biotechnology will play in the implementation of the 2nd medium term plan of Kenya's Vision 2030.

Sharing Experiences from Brazil

1. Benefits of GMO Crops from Brazil Case Study by Robert Mburu of Gicheha Farms Ltd.

Farmers in Brazil reported that GM crops had helped them to achieve increased crop yields of high quality due to the inbuilt resistance against pests. They have therefore been

enabled to optimize production. The crops have also reduced production costs, most of which would go to both insecticide and herbicide sprays. Further, labour costs have been reduced significantly. All these benefits result to more income for the farmers.

Over the last fifty years, Brazilian growers have been able to boost grain output 12-fold while increasing planted area 2.5-fold only as indicated in table 3. The country's total hectareage of biotech soybean, maize and cotton was estimated at ~44.2 million hectares in 2015, which represented 25 % of the global hectareage of the crops.



Mr. Robert Mburu engages with EMBRAPA researchers during the study tour

2. Brazil's Biotech Communication Experiences and Lessons Learnt by Patrick Igunza, Royal Media Services

Patrick Igunza summarized his experience in a 3-video series which was aired on Citizen TV in April 2015 with 10 million impressions. The video series titled 'Samba of Shamba' can be accessed on the following links:

https://www.youtube.com/watch?v=aKC9_C-gEpg

<https://www.youtube.com/watch?v=NUyWuB4XP4Y>

https://www.youtube.com/watch?v=HbXwH4WQ_vw

Table 3: Comparison of Brazil's Grain Production in 1960 and in 2014

	1960 (Before biotech crops)	2014 (With biotech crops)
Population	70million	203 million
Grain production	17.2million Tons	202.2 million Tons
Planted area	22 million ha	57.8 million ha
Yield	783 kg/ha	3,501 kg/ha

II. Commemoration of the World Environment Day with the Youth on June 5, 2015

Every year on June 5, the world celebrates World Environment Day (WED). The day was set by the United Nations to encourage global awareness and action for the environment. It serves as the ‘people’s day’ for doing something positive for the environment, galvanizing individual actions into a collective power that generates an exponential positive impact on the planet. The 2015 WED theme was “Seven Billion Dreams. One Planet. Consume with Care.” It reminded humanity that their well-being, that of environment

and functioning of the economy, ultimately depend upon the responsible management of the planet’s natural resources. OFAB Kenya marked this day with a youth forum, creating awareness on agri-biotechnology and encouraging them to actively participate in conserving the environment using the technology. A presentation about Virus Resistant Cassava for Africa (VIRCA) project was made, with emphasis on potential bio-enterprises that youth should engage in with the expected high yields from the crop when commercialized. The youth called on the government to support bio-enterprises, which would lead to reduction of use of harmful pesticides into the environment, less fuel usage and ultimately a cleaner environment.



Hon. Florence Mutua (3rd from left), the guest of honour at the event, OFAB Kenya PC members, and participants pose for a group photo.

Quote from Hon. Florence Mutua: "I am pleased by efforts of OFAB and partners in sensitizing youths on agricultural biotechnology and I ask scientists to hold such forums in various counties."

Issues raised

Question: Can small scale farmers afford to buy the biotech crop seeds every season?

Response: There are efforts geared towards making biotech seeds affordable by all farmers. For example, one of AATF's mandate is to ensure that African farmers get access to such seeds royalty free.

Question: What if new virus strains that affect the transformed cassava emerge?

Response: During research, scientists keep in mind that such challenges may occur and continuously develop strategies to counter them.

Question: Do we have a plant in the pipeline which has been transformed for phytoremediation?

Response: While such technologies have been developed in other parts of the world, Kenya has not utilized them at the moment.

Outcome:

A panel of student leaders was invited to make final remarks. Each student expressed his comments and concerns about the ban on GM food imports and its impact on their studies. Overall, they requested that the government lift the ban on GM crops to promote conducive environment for GM crops development and commercialization. They argued that lifting the GM food import ban would encourage scholars and student to pursue biotech related course.

III. MESH A Conference Luncheon on November 23, 2015

OFAB Kenya has dedicated itself to ensuring an improved collective, rapid and evidence-based response to emerging issues on agricultural biotechnology in the country. It is with this in mind that it supported a luncheon at the 3rd Media for Environment, Science, Health and Agriculture (MESH A) conference in Nairobi. The luncheon in line with the conference's theme: **“Re-ignition of science journalism and communication in East Africa”**, included a speculative presentation: **“Implication of the lifting of the ban on GMO food imports in Kenya.”**



Dr. Roy Mugira makes a presentation during the MESH A luncheon

The presentation was triggered by a statement that had been made earlier by Kenya's Deputy President, H.E William Ruto indicating that the lifting of the ban on GM food imports was imminent. It highlighted what could happen if the GM food import ban was lifted.

On trade: This will widen sources of imports as countries growing GM crops will not be barred from selling these products to the Kenyan market. It will also make products available at low prices. Commodities will be readily available.

On research and academia: There will be enriched partnerships for product development. The lifting of the ban is also likely to enhance interest in biotechnology and GM technology among the youth.

On policy makers: The policy makers will as a result support the implementation of the Biosciences Programme in the Second Medium Term Plan for the Kenya Vision 2030. There is a likelihood of enhanced political good will. It will also re-position Kenya as a leader in the region.

On legal and regulatory framework: NBA will be repositioned as the ultimate agency for approval of GM technology. It will provide a basis for expeditious decision making for NBA. It will also facilitate transit of relief food aid.

On civil society and the media: Civil society activities on both sides of the GMO discourse will be enhanced. There is likely to be heightened media coverage of activities related to the adoption of the GM technology. Legal tussles from the anti-GM technology lobby groups are likely to ensue. There is a likelihood of increased conversations on the subject of biotechnology by both experts and political leaders.

On general public: More opportunities to create awareness and confidence building by the government will be offered. An opportunity to reach out to the counties and to engage in the global biotechnology enterprise will be created. Ultimately, farmers will access biotech/GM research products.

IV. Scientists' Communication Workshop

OFAB-K conducted a science communication workshop on 21st to 22nd October 2015. Participants at the workshop included scientists from research institutions as well as lecturers from private and public universities in Kenya. The main objective of the workshop was to expand the number of scientists that can effectively and confidently engage with the media on biotechnology and biosafety issues. They learned how to develop key messages on biosafety and biotechnology for delivery to various categories of stakeholders. Through mock media interviews, participants practiced how to prepare and articulate appropriate messages, thus enhancing their confidence in engaging with media and the general public by extension. Scientists who have not been

using social media platforms were made aware of their benefits in communicating and getting real time information through various channels.

At the end of the meeting, scientists were particularly pleased by the fact that they could confidently develop key messages on biotechnology and biosafety. They felt more confident in relating with media and delivering their messages, especially in a media interview. The training came at an opportune time when biotechnology debate had been reignited by WEMA Bt Maize application for open release cultivation and pronouncements by the Deputy President that the ban on GMO food imports would be lifted.



Group photo of the science communication workshop

"I am writing to express my gratitude on the media training workshop. It was timely and very enlightening. I have since held two major interviews with film crews from National Geographic and Czech Republic who were interested in coverage of the conservancy's community conservation education program. After the training, preparing for interviews was very easy-knowledge of key messages, choice of words, how to behave in front of a camera and responding to sensitive topics like poaching... I have no idea how it would have been if it weren't for the training. I utilized most if not all of the techniques I learned during the workshop. I am indeed grateful. Thank you ISAAA staff!" **Mercy Njeri, a KUBICO fellow and beneficiary of the science communication training in 2015.**

Issues raised

Question: Why is the negative notion that associates GMO to cancer still prevailing even when no relationship between the two has been established?

Response: There are no facts linking GM food consumption to cancer, therefore the notion has been sustained through sensationalism by people who are not backed by any scientific proof.

Question: What are the negative implications of GMOs?

Response: The likely potential impacts of a new crop is an allergic reaction when eaten. This challenge is however overcome during development process of the products since it is not possible that a GMO crop would be released without having been sufficiently tested.

Question: When the ban was pronounced, what happened to the crops that were on confined field trials?

Response: The ban was on imports of GMO food imports. It did not stop research.

Question: There are reports that India's and South Africa's crop pests have developed resistance to genetically modified crops?

Response: Resistance development has been adequately addressed through planting of refugia, as well as crop rotation. The ever increasing number of farmers who have adopted the crops should be testament enough to the benefits accruing from their use. One other strategy of product stewardship and prevention of resistance build-up by pests is through gene pyramiding/ stacking.

V. Exhibition at an Agri-Business Trade Fair on October 16, 2015

OFAB Kenya held an exhibition at a trade fair dubbed 'About Central Kenya Agri-Business Africa Trade Fair' at Kenya Agricultural and Livestock Research Organization (KALRO) in Thika, Central Kenya. The event was meant to show-case innovations especially to farmers in order to: improve agricultural productivity in the region's agriculture; impart best practice through the use of latest technology in the region's agriculture industry; increase produce quality that leads to increased market access in local and export markets; improve post-harvest handling of agricultural produce and provide opportunities to improve value addition of agricultural produce in the region. A presentation about WEMA Bt maize whose application for environmental release was being evaluated by NBA was made. The

event provided a platform for a one-on-one engagement with farmers on agricultural biotechnology, where information materials were given out.

VI. A Special OFAB with the Legal Fraternity

OFAB Kenya reached out to the legal fraternity in a meeting with the Law Society of Kenya. This was following an invitation by the lawyers to provide basic information about agricultural biotechnology and its potential benefits to Kenyans. They were informed of the trends in adoption of biotech crops globally, regionally and nationally. They were also enlightened on Kenya's capacity to regulate and produce GMOs. Follow up meetings on how to manage the civil case against the government's intention to lift the GMO foods importation ban were also facilitated by OFAB Kenya.

VII. A special OFAB with Bunge la Mwananchi on October 16, 2015

Following protests by a civil society group known as *Bunge La Mwananchi*, OFAB Kenya, through its associates from KUBICO reached out to the group for awareness creation. The participants were informed of the process of genetic modification and the trends in adoption of the biotech crops nationally, regionally and globally. Kenya's capacity to practice GM technology was also highlighted with emphasis on the growing number of institutions carrying out genetic transformation work as well as the increasing number of scientists in the sector. Detailed information on safety of biotech crops for food and feed was also given. Some of the activists confessed to have been opposing the technology based on misinformation. They later gave comments towards Bt cotton application for environmental release to NBA.

Conclusion

Year 2015 was successful for OFAB Kenya based on the number of activities held and some of the outcomes realized. While the four year old ban on GM foods importation remains in place, significant gains were realized in the year. Two applications for open field cultivation of WEMA Bt maize and Bt cotton were submitted to NBA. The government, through the Deputy President gave the greatest indication yet that it could lift the ban on GM foods imports in the near future. These issues shaped the landscape of agri-biotech and biosafety in the country.

The chapter reached out to non-conventional groups including the legal fraternity especially following a court case against the government's intention to lift the ban on GM food imports. The two applications for environmental release of WEMA Bt maize and Bt cotton offered an opportunity for the chapter to inform on the Biosafety Act, 2009 requirement for public comments towards consideration or rejection of the applications

by NBA. Policy outreach was also key in ensuring political good will especially in the county governments.

One of the lessons learnt is that while demand for the technology by farmers keeps increasing, negative information has highly infiltrated the public especially at the grassroots. This is due to the heightened efforts by anti-GM groups. Reversal of this requires sustained efforts from all stakeholders. Thus, there is a clear need to communicate more effectively to the grassroot communities and to involve high level personalities in awareness events to increase their visibility and attract many varied participants.

Going forward, the chapter will put more emphasis on and dedicate more resources to county events. OFAB Kenya must consider the youth's position in community opinion shaping especially on emerging technology and increase its engagement with them. Deliberate efforts must be put to sustain the political goodwill realized.

Feedback from OFAB County Events

The participants of OFAB county events through their feedback have highlighted several important areas that require attention as more awareness creation activities are planned in the future. The survey was conducted among participants of OFAB events in Kericho attended by youth farmers from South Rift region, in Eldoret attended by maize farmers from North Rift region and in Busia attended by cotton farmers from Western region. The survey showed that youthful farmers prefer agri-biotech information from research institutions, universities and the internet as shown in figure 2. Maize farmers from North Rift counties trust information received during farmer field days and from mass media (figure 3). Unlike the youthful farmers, maize farmers do not view universities as very important sources of information.

Figure 2: Important sources of agri-biotech information according to youthful farmers

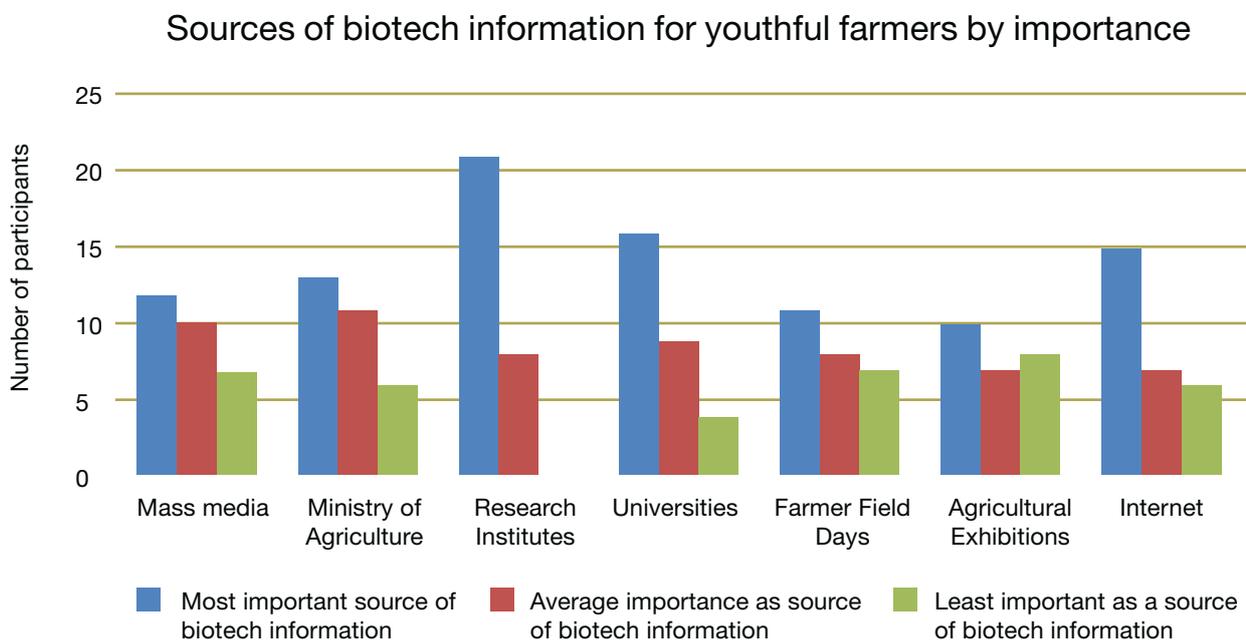
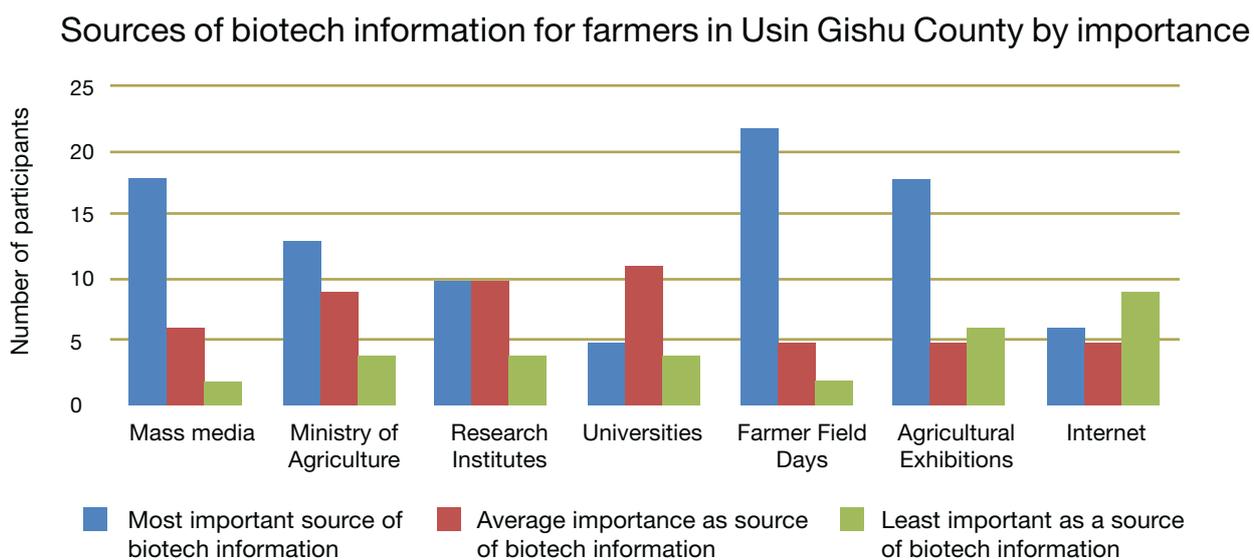
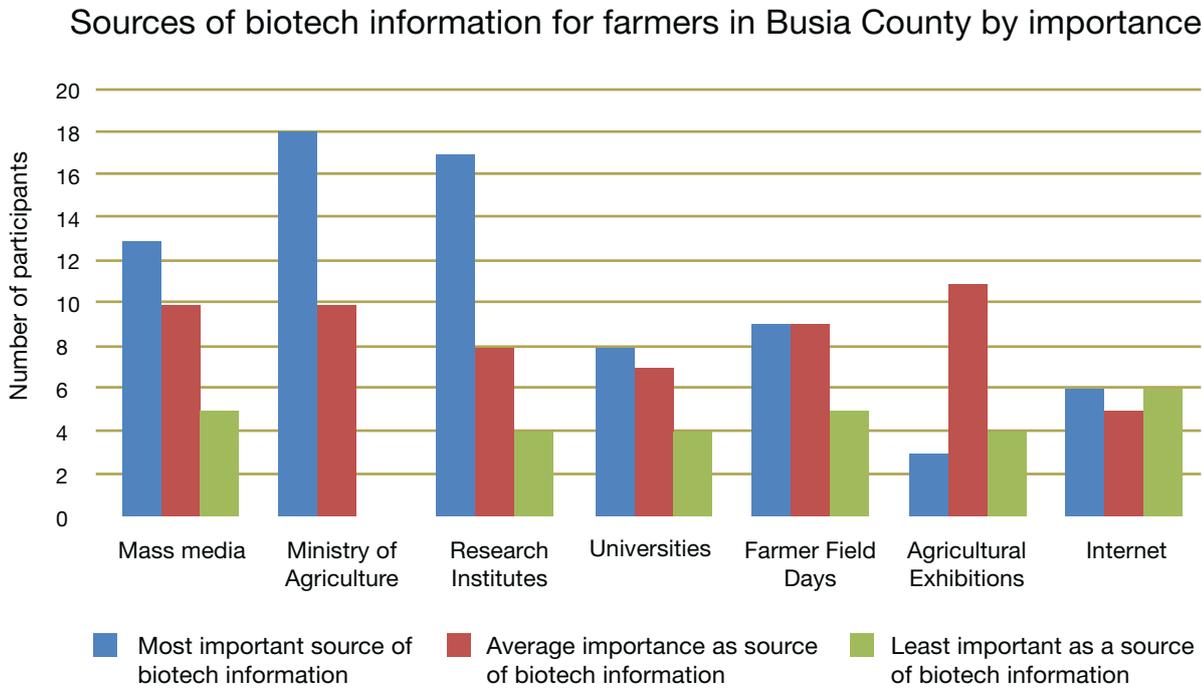


Figure 3: Sources of agri-biotech information for maize farmers in North Rift counties by importance



For cotton farmers in Busia, the most important sources of agri-biotech information are extension workers from Ministry of Agriculture, Livestock and Fisheries followed by information from research institutions (Figure 4). They also value information from farmer field days and exhibitions.

Figure 4: Sources of agri-biotech information for cotton farmers in Busia County by importance



Concerns among Participants about Agri-biotech and Biosafety

The participants of the three different meetings who represented the wide variety of OFAB functions' participants, although with varied concerns about agri-biotech and biosafety, their common main concern was on safety to human health. The participants required general information about the biotech crops. The youthful farmers needed to get information about development of the products while farmers needed to know whether the technology enhances some agronomic traits such as time to maturity. The farmers also wanted information regarding seed marketing. Few participants required information on environmental safety.

Annexes

Annex 1: Eastern and Central Region Farmers' Communique and Signatures during Embu County OFAB

Farmers' Communique to the President:

WE DEMAND Bt COTTON SEEDS FOR OUR FARMS AND URGE THE GOVERNMENT TO LIFT GMO BAN IN KENYA

We the Cotton farmers from the Counties of Embu, Kirinyaga, Kisumu, Kitui, Machakos, Makueni, Meru, Murang'a, Tharaka Nithi have on this 5th day of February, 2015 made the following observations and decisions on Bt cotton and the GMO ban in Kenya:

The cotton farmers of Kenya;

Take note that:

1. Systematic failures in the cotton value chain including pests and diseases are largely attributed as factors that led to the collapse of the once vibrant cotton sector in Kenya. From producing 70,000 bales of cotton in 1985, the country currently produces less than 20,000 bales of cotton. It is also estimated that as a result of the collapse of the sector, the country has lost more than 600,000 job opportunities.
2. Kenya has invested heavily in efficient agricultural technologies research. The Kenya Agricultural and Livestock Research Organization (KALRO) has been undertaking research on Bt cotton since the year 2000 with the goal of coming up with cotton varieties that are resistant to pests and diseases. The varieties tested by KALRO are Bolgard I and Bolgard II.
3. The GM technology of Bt Cotton incorporates resistance to the African bollworm, the most destructive pest for cotton which can cause up to 100 % yield loss. Bt cotton is however resistant to the pest. Bt cotton promises
 - Improved productivity of cotton yields
 - Increase in income from yields and cost saved from pesticide purchase thereby contribution to poverty alleviation.
 - Protects biodiversity due to reduced toxicity of the pesticide use in the environment and health of the farmers.
4. Education and awareness creation trips to Burkina Faso, South Africa and the United States of America on experience sharing workshops with fellow cotton farmers, technology developers and the ginners reveal comparative advantage and clear global competitiveness for Bt Cotton in Kenya.
5. The existing GM imports ban is however a stumbling block standing between farmers and this new improved cotton variety. The national regulatory and advisory agencies are committed to safe deployment of biotechnology alongside conventional techniques are appropriate for Kenya people.

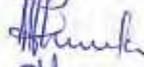
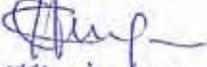
Way forward

- i. To promote Public Biotechnology Awareness implementation through deliberative farmer groups dialogue with factual evidence-based information about biotechnology applications, use and products
- ii. Lift the ban on GMO to facilitate the commercialization of genetically modified crop varieties as products of modern biotechnology for socio-economic development and competitiveness

The communiqué was signed by 29 cotton farmer representatives from the above mentioned counties.

Embu & Central Kenya Counties		
Name	County	Signature
1. Daniel Mugo Magandu	Kirinyaga	
2. John Nganga	Kirinyaga	
3. Joseph Thika	Kirinyaga	
4. Joseph Pamba	Embu	
5. Rev Edward Gitonga	Embu	
6. Estephania Gataki	Embu	
7. Kennedy Muriithi	Kirinyaga	
8. Evans Ngure	Kirinyaga	
9. Dorcas Wawira	Murang'a	
10. Peter Njeru	Embu	

Meru Region Counties

Name	County	Signature
1. Rev. Joshua Wthugg		
2) Ch Gregory Kaburu		
3. LUCH CISONGA		
4 MATHEW KIRKA		
5. George Onyino		
6 Andrew Muriithi		

Ukambani Region Counties

Name	County	Signature
1. JACOB M. MUTISO - MACHAKOS		
(2) JAIRUS M. KITEMA - KITUI		
(3) TITUS K. MUMU - MACHAKOS		
(4) ZIPPORAH M. MUMU - KITUI		
(5) STEPHEN M. NZIOKA - MAKUENI		
(6) PHILIP M. KAMUYA - MAKUENI		
(7) COLLETA M. MUSAU - MAKUENI		
(8) JOHN K. MUTINDA - MAKUENI		
(9) FRANCIS M. KAVIUYA - KITUI		
(10) SEPTEN K. MWANZI - KITUI		
(11) BENJAMIN M. MUTIA - KITUI		
(12) KENEITH MURITHI - KARABA		
(13) BENEDECT M. MBINDYO - MACHAKOS		

Annex 2: South Rift Region Youth Communique and Signatures during Kericho County OFAB

WE SUPPORT THE DEPUTY PRESIDENT H.E. WILLIAM RUTO'S PROMISE TO LIFT THE GMO BAN AND CALL FOR ACCESS TO PRODUCTS OF MODERN BIOTECHNOLOGY TO RESOLVE SOME OF OUR COUNTRY'S AGRICULTURAL CHALLENGES

We the young farmers from Rift Valley have on this 2nd day of September, 2015 in Kericho County made the following observations and decisions on biotech crops and the GMO ban in Kenya:

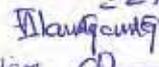
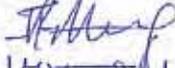
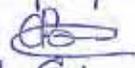
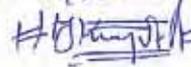
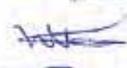
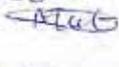
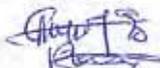
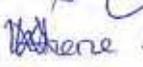
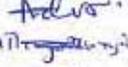
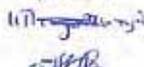
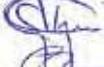
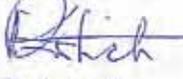
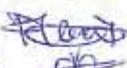
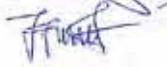
1. The government through the Deputy President H.E. William Ruto has made a commitment to lift the ban on GMOs in the coming weeks.
2. Kenya has invested heavily in efficient agricultural technologies research. We applaud the government for enabling the Kenya Agricultural and Livestock Research Organization (KALRO) to undertake research on a number of important food security crops including maize, cotton, cassava, sweet potato and sorghum, with the end goal of coming up with improved varieties that have various beneficial qualities such as drought tolerance, insect and virus resistance, as well as nutritional enhancement. We also acknowledge that the efforts to find efficient and effective solutions for Kenyan farmers started as far back as 1991 when KALRO first initiated the virus resistant sweet potato project.
3. In addition to GM technology having the potential to significantly improve farm productivity, household income and food security, it has the potential for job creation for a big number of youths through direct farming or other innovative bioenterprises. We are encouraged by the voices of our fellow young people in countries such as Burkina Faso, South Africa and Sudan who are reaping huge benefits accrued from adopting GM technology and whose lives are evidently improving as a result.
4. The existing GM imports ban is however a stumbling block standing between the youth and these benefits. We are confident that the national regulatory and advisory agencies are committed to the safe deployment of agricultural biotechnology products and acknowledge that these products are not a silver bullet to all our problems. We also appreciate that these modern technologies can be used alongside conventional techniques and are appropriate for the Kenyan people.
5. The debate around genetically modified products is often characterized by emotive and misleading information. We applaud the public and private sector's efforts to get credible scientific information down to the grass-roots and urge that the farmers' voices are made an integral part of the agricultural biotechnology discussion.

We hereby request that the government should:

- i. Put in place efficient programs to improve awareness on the benefits and safety of GM crops among young farmers.
- ii. Fast track the lifting of the ban on GMO to facilitate the commercialization of genetically modified crop varieties as products of modern biotechnology for socio-economic development and competitiveness

TOM Wamala 

Signed by:

Timothy Kiprotich - 	Elwam Leonard T. 
Colvin Omayo - 	Anthony Kipono 
Bernard Tuo Kipatili 	BAVINA SILEM 
KIBET SANG 	GARDSON ILIYA 
WESLEY KIBET 	CHARLES KIRUI 
GILBERT BETT 	JUSTICE KIBET 
MARTIN GITINGA 	KIPKIRUI RONARD 
Obaire O. Mubari 	EVA CHERONO 
Liz Mwangi 	MONICA H. KIBE 
Sammy Kipimo 	VINCENT KIRUI 
Sammy Ngetich 	Beatrice chepkemai 
EUNICE SHISINGA 	RICHARD KUIRI 
Kenny Ithuan 	NAVY KARIN 
KIBET LANGAT 	JOEL K. TOCHI 
BENJAMIN KIBET 	KIPKEMOI KOTOR 
Fredrick Bett 	WENDET TEBEN 
Anjeline Mene 	MICHAEL ARNOLD 
Hilary Koedi 	Paul Thinyi 
Bernad Koedi 	KOLIE SILVESTER 
DANIEL K. ROP 	
KACHEI SIMON 	
John JACOB 	
Richard Rofich 	
PETER MECHANAS 	
ODUOR MUTINEI 	
Jonathan Luga 	
STANIS O. OCHOI 	

Annex 3: North Rift Region Farmers' Communique and Signatures during Uasin Gishu OFAB

WE SUPPORT THE DEPUTY PRESIDENT H.E. WILLIAM RUTO'S PROMISE TO LIFT THE GMO BAN AND CALL FOR ACCESS TO PRODUCTS OF MODERN BIOTECHNOLOGY TO RESOLVE SOME OF OUR AGRICULTURAL CHALLENGES

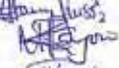
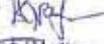
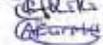
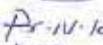
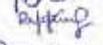
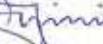
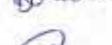
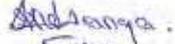
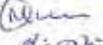
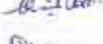
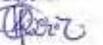
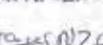
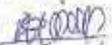
We the maize farmers from North Rift Counties have on this 3rd day of September, 2015 made the following observations and decisions on biotech crops and the GMO ban in Kenya:

1. The government through the Deputy President H.E. William Ruto has made a commitment to lift the ban on GMOs in the coming weeks
2. Kenya has invested heavily in efficient agricultural technologies research. We applaud the government for enabling the Kenya Agricultural and Livestock Research Organization (KALRO) to undertake research on a number of important food security crops including maize, cotton, cassava, sweet potato and sorghum, with the end goal of coming up with improved varieties that have various beneficial qualities such as drought tolerance, insect and virus resistance, as well as nutritional enhancement. We also acknowledge that the efforts to find efficient and effective solutions for Kenyan farmers started as far back as 1991 when KALRO first initiated the virus resistant sweet potato project.
3. GM technology has the potential to significantly improve farm productivity, household income and food security. We are encouraged by the voices of our fellow farmers in countries such as Burkina Faso, South Africa and Sudan who are reaping huge benefits accrued from adopting GM technology and whose lives are evidently improving as a result.
4. The existing GM imports ban is however a stumbling block standing between farmers and these new improved crop varieties. We are confident that the national regulatory and advisory agencies are committed to the safe deployment of agricultural biotechnology products and acknowledge that these products are not a silver bullet to all our problems. We also appreciate that these modern technologies can be used alongside conventional techniques and are appropriate for the Kenyan people.
5. The debate around genetically modified products is often characterized by emotive and misleading information. We applaud the public and private sector's efforts to get credible scientific information down to the grass-roots and urge that the farmers' voices are made an integral part of the agricultural biotechnology discussion.

We hereby request that the government should:

- i. Further promote public biotechnology awareness implementation through deliberative farmer groups' dialogue with factual evidence-based information about biotechnology applications, use and products.
- ii. Fast-track the lifting of the ban on GMO to facilitate the commercialization of genetically modified crop varieties as products of modern biotechnology for socio-economic development and competitiveness.

Signed by:

1. MUSTA - K. Tum 
2. Flora Kogo 
3. Francis Kambau 
4. CHARLES KIMOSOP 
5. EVELLYNE KEMBOI 
6. DAVID GITAU 
7. MICHAEL KADYORO 
8. JANE WALUGENGO 
9. CAREN LIKOTO WANAKSANA 
10. ANITHA OLOMON 
11. PETER NYONGESH 
12. KENNEDY MUKABWA 
13. MILLICENT SIPUNA 
14. Boniface Kwarui 
14. THOMAS LIVA 
15. Zack Kushe 
15. Boniface Karaki 
16. Basolina pepela 
17. Nicholas Karakaeta 
18. JUSTUS WAJANGO 
19. Ediel Kiplagat 
20. Kiprop Cherumbi 
21. JUSTUA KIPAGAT 
22. Joyce Maraka 
23. FLORENCE LIBOROH 
24. OSINDO KHAUSA 
25. NATHAN ONGOLE 
26. CLEOPHAS CHEPSIRO 
27. Felix Junibe 
28. MARTHA AYLINA A 
29. HILARY BAYINA 
30. Nicholas Kamukaly 
31. Jason M Nyamira - Trans-Nzoia - 
32. ESTHER M MURUKU - Trans-Nzoia - 
33. JUSTICE D. OLIWELI - Trans-Nzoia - 
34. Julius C. Ngata - Kericho County - 
35. MUSA M. NAIKEI - Trans-Nzoia/Saboti - 

Annex 4: Coastal Region Farmers' Communique and Signatures during Kilifi County OFAB

WE URGE GOVERNMENT TO LIFT THE GMO BAN AND CALL FOR ACCESS TO PRODUCTS OF MODERN BIOTECHNOLOGY TO RESOLVE SOME OF OUR AGRICULTURAL CHALLENGES

We the farmers from **Kilifi County** have on this 9th day of July, 2015 made the following observations and decisions on biotech crops and the GMO ban in Kenya:

Take note that:

1. Kenya has invested heavily in efficient agricultural technologies research. We applaud the government for enabling the Kenya Agricultural and Livestock Research Organization (KALRO) to undertake research on a number of important food security crops including maize, cotton, cassava, sweet potato and sorghum, with the end goal of coming up with improved varieties that have various beneficial qualities such as drought tolerance, insect and virus resistance, as well as nutritional enhancement. We also acknowledge that the efforts to find efficient and effective solutions for Kenyan farmers started as far back as 1991 when KALRO first initiated the virus resistant sweet potato project.
2. GM technology has the potential to significantly improve farm productivity, household income and food security. We are encouraged by the voices of our fellow farmers in countries such as Burkina Faso, South Africa and Sudan who are reaping huge benefits accrued from adopting GM technology and whose lives are evidently improving as a result.
3. The existing GM imports ban is however a stumbling block standing between farmers and these new improved crop varieties. We are confident that the national regulatory and advisory agencies are committed to the safe deployment of agricultural biotechnology products and acknowledge that these products are not a silver bullet to all our problems. We also appreciate that these modern technologies can be used alongside conventional techniques and are appropriate for the Kenyan people.
4. The debate around genetically modified products is often characterized by emotive and misleading information. We applaud the public and private sector's efforts to get credible scientific information down to the grass-roots and urge that the farmers' voices are made an integral part of the agricultural biotechnology discussion.

We hereby request that the government should:

- i. Further promote public biotechnology awareness implementation through deliberative farmer groups' dialogue with factual evidence-based information about biotechnology applications, use and products.
- ii. Lift the ban on GMO to facilitate the commercialization of genetically modified crop varieties as products of modern biotechnology for socio-economic development and competitiveness.
- iii. Improve the policy and regulatory environment so as to fast-track the adoption of agricultural biotechnology and accord farmers their right to choose.

OFAB Kenya Programming Committee Members

Dr. Margaret Karembu-ISAAA, Chair OFAB Kenya



Dr. Karembu is the Director of ISAAA *AfriCenter* and also the Chair of OFAB Kenya chapter Programming Committee. She has vast experience in managing, implementing and coordinating technology transfer projects as well as diffusion studies on modern biotechnology. A science communications specialist, Margaret holds a PhD Degree in Environmental Science Education from Kenyatta University, Kenya.

Mrs. Nancy Muchiri – AATF

Mrs. Muchiri is the Communications and Partnerships Manager at AATF. She is responsible for managing the Foundation's public and partnership relationships through strategic communications to enhance visibility and positioning of the Foundation and its projects. Nancy has an MSc Degree in Organisational Development from the United States International University, Kenya



Dr. Dan Kiambi-ABCIC



Dr. Kiambi is the Executive Director of African Biodiversity Conservation and Innovations Centre (ABCIC). He has vast experience in agrobiodiversity and plant genetic resources conservation and sustainable utilization. Dan holds a PhD in Biological Sciences (plant molecular diversity and ecogeographic survey) from the University of Birmingham UK.

Dr. Simon Gichuki- KALRO

Dr. Gichuki is the head of KALRO Biotechnology Centre. He is an active participant in biotechnology and biosafety policy development at the national, regional and international levels. Simon holds a PhD in Molecular Genetics and Plant Breeding from the University of Agricultural Sciences, Vienna (Austria).



Prof. Eucharia Kenya- Embu University College



Prof. Kenya is the Deputy Principal in charge of Planning, Administration and Finance, at Embu University College, a constituent of the University of Nairobi. She holds a PhD in Applied Entomology from the Rivers State University of Science and Technology, Nigeria.

Dr. Fred Kanampiu- IITA

Dr. Kanampiu is a project coordinator at IITA. He has vast experience and interest in striga weed management, natural resource management and capacity building. Fred has a PhD Degree in Soil Fertility from Oklahoma State University, Stillwater, USA.



Mrs. Jane Otadoh - Ministry of Agriculture, Livestock and Fisheries



Mrs. Otadoh is an Assistant Director of Agriculture in the Ministry of Agriculture, Livestock and Fisheries. She currently represents the Principal Secretary of Agriculture in the National Biosafety Authority Board and in the OFAB Programming Committee. She holds an MSc Degree in Plant Biotechnology from the University of Nairobi.

Mr. Paul Chege - ISAAA, Liaison Officer OFAB Kenya

Paul is the Program Officer in charge of OFAB-Kenya secretariat at ISAAA AfriCenter. He holds an MSc Degree in Agricultural Biotechnology from Szent Istvan University in Gödöllő, Hungary.





Mrs. Brigitte Bitta-ISAAA, Secretary OFAB Kenya

Mrs. Bitta is a Program Assistant at ISAAA AfriCenter and also the Secretary of the OFAB Kenya Chapter PC. She assists in managing the Biotech Information Centers in East and West Africa. Brigitte is currently pursuing an MSc in Agricultural, Information, Communication Management at the University of Nairobi.

Mrs. Doris Wangari, PBS

Doris Wangari is the PBS Kenya Country Coordinator. She was previously a Biosafety Officer at the National Biosafety Authority (NBA). She holds a Masters degree in Biotechnology from Jomo Kenyatta University of Agriculture and Technology.



About OFAB

The Open Forum on Agricultural Biotechnology in Africa (OFAB) is a platform that brings together stakeholders in agricultural biotechnology for frank discussions on all aspects of the technology. It aims at enhancing knowledge sharing and awareness creation that will raise understanding and appreciation of agricultural biotechnology, thus contribute to building an enabling environment for decision making. OFAB is currently operational in eight countries: Burkina Faso, Ethiopia, Ghana, Kenya, Nigeria, Tanzania, Uganda and Zimbabwe.

OFAB Kenya is the pioneer chapter of the Open Forum on Agricultural Biotechnology in Africa. It is currently hosted by the International Service for the Acquisition of Agri-biotech Applications (ISAAA), *AfriCenter*, under a collaborative agreement with the African Agricultural Technology Foundation (AATF).

ISAAA *AfriCenter*,
ILRI Campus, Old Naivasha Road,
P. O. Box 70 - 00605, Nairobi, Kenya.
Tel: + 254 20 4223618,
Email: africenter@isaaa.org,
Website: www.africenter.isaaa.org

African Agricultural Technology Foundation,
ILRI Campus, Old Naivasha Road,
P.O. Box 30709 - 00100, Nairobi, Kenya.
Tel: +254 20 4223700,
Email: aatf@aatf-africa.org
Website: www.aatf-africa.org



Open Forum on Agricultural Biotechnology - Kenya Chapter



@OFABKenya