



Biosafety News

Championing for a Biosafe Nation
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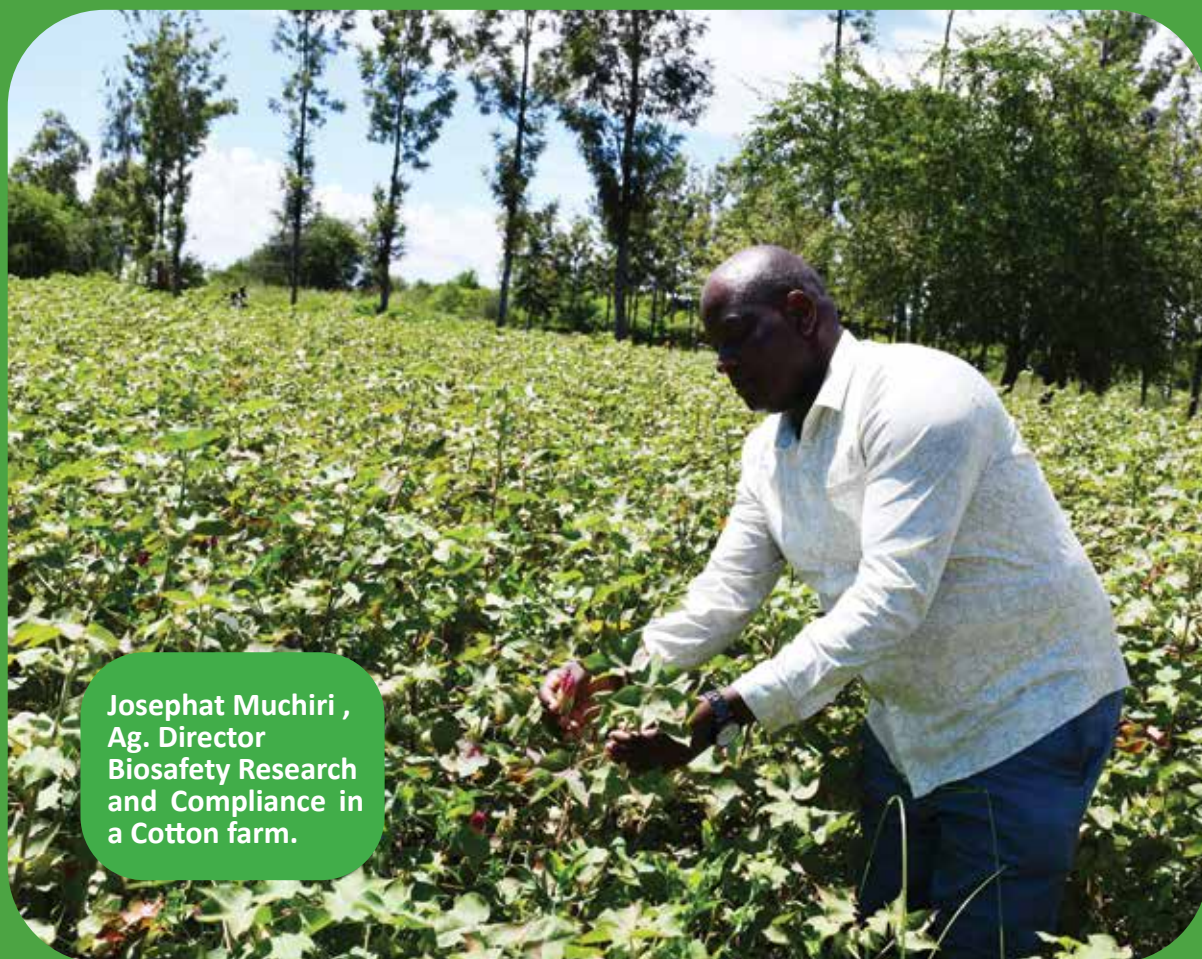
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Championing for a Biosafe Nation

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**Josephat Muchiri ,
Ag. Director
Biosafety Research
and Compliance in
a Cotton farm.**

Editor's Note

Dear esteemed readers,

I welcome you to our 9th issue of the Biosafety Newsletter. In this issue we take you through the colourful launch of the National Biosafety Authority 2023-2027 Strategic Plan which was launched in May this year. The document outlines various activities to be conducted for the realization of the mandate of the Authority.

The Strategic Plan provides direction to achieving the Medium-Term Plan (MTP-IV) of Kenya Vision 2030 and the Bottom-up Economic Transformation Agenda (BETA).

In line with its mandate, the Authority has identified eight Key Result Areas (KRAs) in the plan which is: public awareness and education on biosafety, dynamic laws and institutional policies on biosafety; biosafety assessments; compliance and enforcement; biosafety information management; international partnerships and collaborative engagement in the implementation of the protocol and the CBD; infrastructural and operational efficiency; and human resource management.

The Authority also embarked on minimum review of the Biosafety Act Cap 320 of the laws of Kenya with the focus of incorporating emerging modern biotechnology issues in the Act.

The issue also looks at the preparation for the 13th Annual Biosafety Conference whose theme is: *13 Years Later: Building Trust and Ensuring Safety of Genetically Modified Organisms*.

The event which will run from 10th-12th June will be officially opened by Agriculture and Livestock Development Cabinet Secretary Sen. Hon. Mutahi Kagwe.

Some of the sub themes for the forum are; regulatory frameworks for GMO safety which will explore the policies, laws, and institutional frameworks governing the safe development, handling, and commercialization of genetically modified organisms (GMOs).

The issue looks at the Board of Directors visit to One Stop Border post (OSBP) in Busia, Mombasa and Namanga to review their performance and gauge their preparedness and positioning to handle the



Mr. Ouma Wanzala

Authority's mandate in the region in the short and long term.

We also focus on Authority's engagement with various stakeholders as it moves to strengthen public education and combat widespread misinformation around genetically modified organisms (GMOs).

Under the corporate social responsibility, the Authority continues to partner with various schools in the ongoing national tree growing restoration campaign which aims ensure that the Country achieves target forest cover by 2032.

The exercise is being spearheaded by the national government led by H.E President Dr. William Ruto with a target 15billion trees planted by 2032.

In order to be able to handle various complaints from various stakeholders, the Commission on Administrative Justice sensitized members of the Authority's Complaint handling Committee on effective public complaints management and Access to Information Act, 2016.

The training focused on pursuit of excellent citizen service delivery: strengthening the touch points and working on the pain points within the institution. Lastly, as part of our mandate on awareness creation on GMO matters, we gladly welcome any comments from our readers.

Enjoy the read!

Message from the Ag. Chief Executive Officer

Forging ahead despite challenges

Dear Esteemed Stakeholders,

The launch of our Strategic Plan 2023-2027 in May is a great achievement and signifies our determination in providing quality service delivery and commitment to serve with integrity, professionalism, customer focus, inclusiveness and sustainability since “what is not planned, measured and timed cannot be accomplished”.

This is a journey that we have walked with various stakeholders among them the Government which has supported us to come up with this document that represents a third-generation strategy for the Authority, succeeding the partially implemented 2020-2025 plan.

This Plan identifies key achievements, challenges and lessons learnt and serves as a foundation for ensuring alignment with current government priorities and regulatory requirements and also efforts have been made to realign the resources available to the Authority with key strategic objectives and the planned annual activities.

It is also important to note that the Authority will hold its 13th Annual Biosafety Conference that will relook at progress so far made in the biosafety sector. The conference is themed: 13 Years Later: Building Trust and Ensuring Safety of Genetically Modified Organisms, and will bring experts, scholars and government officers together to deliberate on the issues about modern biotechnologies.

The Conference which will be a National dialogue on modern biotechnologies and biosafety matters will run from 10th-12th June and will be officially opened by Agriculture and Livestock Development Cabinet Secretary Sen. Hon. Mutahi Kagwe.



The Authority also embarked on the review of the Biosafety Act Cap 320 in order to align it with emerging modern biotechnology. This exercise involves all our stakeholders whom we hope to walk with us until we realize our Plan.

The Authority continues to face a number of challenges among them numerous litigations challenging lifting of a 10-year ban on GMOs and its derived products by the Cabinet on 3rd October, 2022.

These cases have continued to derail activities of the Authority among them release of the Bt. Maize for placement into the market.

This year, the Authority has also stepped-up public awareness campaign to educate Kenyans on GMO foods, including regulatory safeguards, and the importance of informed consumer choice. The misinformation about GMOs and their derived products has made Kenyans to have negative attitude towards the product despite Kenya having a robust legal framework to regulate the sector.

Nehemiah Ngetich.
Ag. Chief Executive Officer

Our roadmap

The Authority unveils 2023-2027 Strategic Plan in a colorful ceremony

The National Biosafety Authority (NBA) in May unveiled its 2023-2027 Strategic Plan that it says will propel it towards the attainment of its mission of facilitating safe development, transfer, handling, and use of genetically modified organisms (GMOs) in the Country.

The Strategic Plan which was unveiled by Agriculture Engineering Secretary Eng. Laban Kiplagat on behalf of Agriculture Principal Secretary Dr. Paul Ronoh in Nairobi, serves as a framework for achieving strategic goals through optimal utilization of available resources and aligns its mandate with the government’s Medium-Term Expenditure Framework (MTEF), Bottom-up Economic Transformation Agenda (BETA) and MTP IV (2023 -2027).

Eng. Kiplagat welcomed the development of the Strategic Plan, noting its reflection of the Authority’s commitment to safeguarding human and animal health, protecting the environment, and fostering responsible innovation in modern biotechnology. “As a Ministry we appreciate the efforts and resources the Authority has put together with the involvement of all stakeholders to come up with

this important document,” said Eng. Kiplagat.

Josphat Muchiri, Ag. Director, Biosafety Research and Compliance at the Authority took participants through the implementation of the Strategic Plan.

“This Plan will be achieved through strategic objectives across eight Key Result Areas (KRAs), each supported by targeted strategies to guide its efforts over the next three years,” explained Muchiri.

The eight Key Result Areas (KRAs) in the plan are: public awareness and education on biosafety; dynamic laws and institutional policies on biosafety; biosafety assessments; compliance and enforcement; biosafety information management; international partnerships and collaborative engagement in the implementation of the protocol and the Convention on Biological Diversity; infrastructural and operational efficiency; and human resource management. Muchiri disclosed that the projected financial resource requirements for implementation of the strategic plan over the planned period is Ksh1.94billion while monitoring and evaluation will be done through; quarterly reports, annual reports, mid-term evaluation and end-term evaluation.



NBA Acting Chief executive officer Nehemiah Ngetich makes his remarks.



NBA Board of Director Prof Jenesio Kinyamario makes his remarks during the launch.



Eng. Laban Kiplagat, Agriculture Engineering Secretary makes his remarks.



Josphat Muchiri, Ag. Director Biosafety Research and Compliance makes a presentation on the Strategic Plan.

How it went down during Strategic Plan launch in Nairobi on 5th May 2025.



The Strategic Plan to propel the Authority towards the attainment of its mandate.

Abridged version of the speech delivered by Agriculture Principal Secretary Dr. Kipronoh Ronoh Paul, CBS during the launch of the National Biosafety Authority Strategic Plan 2023-2027.

This Strategic Plan will propel the Authority towards the attainment of its mandate as since its crafting involved a wider range of stakeholders.

The Plan will also steer the Authority's initiatives, priorities, and actions towards achieving strategic goals through optimal utilization of available resources and in line with government's Vision 2030 MTP IV (2023-2027), Bottom-up Economic Transformation Agenda (BETA) and other global instruments such as the United Nations 2030 Agenda for Sustainable

Development, the African Union's Agenda 2063 and the East African Community Vision 2050.

This is a firm reflection of the government's commitment to safeguarding human and animal health, protecting the environment, and fostering responsible innovation in modern biotechnology.

Recognizing the application of modern biotechnology cuts across various sectors of the economy such as agriculture, industry, environment, medicine, wildlife, fisheries, forestry among others, the placement of NBA in



Agriculture Principal Secretary Dr. Paul Ronoh.

the Ministry of Agriculture and Livestock Development has given fresh impetus to the application of modern biotechnology to enhance agricultural productivity in contributing to food and nutrition security.

This plan has positioned the Authority and the Ministry at large at a vantage point in facilitating the national ambition of Kenya becoming a key participant in the global biotechnology enterprise, as envisioned in the National Biotechnology Development Policy of 2006.

This Strategic Plan will be achieved through strategic objectives across eight Key Result Areas (KRAs), each supported by targeted strategies to guide its efforts over the next five years and therefore, the journey ahead is promising, as the Authority is poised to make significant strides in modern biotechnology and other innovations.

Since its inception, the Authority has done tremendous work in this country. The achievements made during implementation of the previous Strategic Plan are commendable but should be taken a notch higher. The implementation of the four regulations namely; Biosafety (contained Use) regulations, 2011, Biosafety (import, export and transit) regulations, 2011, Biosafety (environmental release) regulations, 2011 and Biosafety (labeling) regulations 2012 has been done as envisaged.

The Authority's role fits well with the government agenda; The Bottom-Up Economic Transformation Agenda (BeTA) focusing on agricultural transformation and inclusive

growth, transforming the micro, small and medium enterprises (MSMEs) economy among others.

In line with its mandate, the Authority has identified eight Key Result Areas (KRAs) in the Strategic plan which are: Public Awareness and Education on Biosafety; Dynamic Laws and Institutional Policies on Biosafety; Biosafety Assessments; Compliance and Enforcement; Biosafety Information Management; International partnerships and collaborative engagement in the Implementation of the Cartagena Protocol on Biosafety; Infrastructural and Operational Efficiency; and Human Resource Management.

The implementation of this plan will also require substantial amount of resources and therefore, the Ministry of Agriculture and Livestock Development will continue to support the Authority with the required resources.

Reaching this milestone has taken immense effort and collaboration. The journey has involved numerous individuals, organizations, and considerable investments from both the government and our partners. Please accept my profound gratitude for your invaluable contributions. Your dedication and hard work are the driving forces behind our success.

The Authority has made several achievements among them; the allocation of Land for the construction of NBA Headquarters that will also host a Regional Reference Molecular Laboratory, commissioning of a GMO Testing Laboratory in 2022,

the automation of services on the E-Citizen and KENTRADE Platforms, the approval for the commercialization of Bt cotton in 2020, continued ISO certification on Quality Management System, a couple of Corporate Social responsibility initiatives such as tree planting exercises in various schools, promotion of public awareness and education on biosafety matters and decentralization of NBA services to regions such as Mombasa, Busia, Namanga, Malaba, Lunga Lunga and Taita Taveta.

It is imperative to note that an organization's growth cannot be realized without the support of a visionary board, steadfast management, staff, and partners who have the zeal and passion to go an extra mile, continue working together towards the realization of the mandate of the Authority which is to exercise general supervision and control over the transfer, handling and use of Genetically Modified Organisms (GMOs) with a view to ensuring safety of human and animal health and provision of adequate protection of the environment.

Kenya has a robust legal, regulatory and institutional capacity to ensure and assure safety of GMOs and their derived products.

The Authority is also the designated National Focal Point to the Cartagena Protocol and serves as the liaison agency between the Government of Kenya and the Secretariat of the Protocol on all biosafety matters relating to GMOs and related technologies.

The Strategic Plan to give NBA direction

Abridged version of National Biosafety Authority (NBA) Board of Directors Chairperson Prof. Jenesis Kinyamario during the launch of the Authority's Strategic Plan 2023-2027.

The Authority's Strategic Plan defines the direction that it will take in the coming years as it undertakes its mandate of exercising general supervision and control over the transfer, handling and use of Genetically Modified Organisms (GMOs), with a view to ensuring safety of human and animal health and provision of adequate protection of the environment.

The Strategic Plan has given the time and opportunity to look back, assess the progress made in implementation of the 2020-2025, challenges encountered, and provide strategic recommendations for the way forward and help it to appreciate emerging issues, reflect on what worked well and what did not work and identify corrective measures that should be put in place.

It is gratifying to note the involvement of all our stakeholders in this exercise, thus taking into consideration the concerns of interested parties and ensuring that the process is in line with the letter and spirit of the Constitution 2010.

This Strategic Plan was prepared in the context of the National Development Agenda namely the Kenya Vision 2030, Medium-Term Expenditure Framework (MTEF), Bottom-up Economic Transformation Agenda (BETA) and MTP IV (2023 -2027) and the Constitution of Kenya 2010.



Board of Directors
Chairperson Prof. Jenesis
Kinyamario.



The Strategic Plan has given the time and opportunity to look back, assess the progress made in implementation of the 2020-2025, challenges encountered, and provide strategic recommendations for the way forward and help it to appreciate emerging issues, reflect on what worked well and what did not work and identify corrective measures that should be put in place.

The Plan will be achieved through strategic objectives across eight Key Result Areas (KRAs), each supported by targeted strategies to guide its efforts over the coming years. The eight Key Result Areas (KRAs) are: public awareness and education on biosafety, dynamic laws and institutional policies on biosafety; biosafety assessments; compliance and enforcement; biosafety information management; international partnerships and collaborative engagement in the implementation of the protocol and the CBD; infrastructural and operational efficiency; and human resource management and will require about Ksh1.94billion for implementation.

The Authority has made notable progress in undertaking its mandate as it has acquired Land for the construction of NBA Headquarters that will also host a Regional Reference Molecular Laboratory, established a GMO testing laboratory and approval commercialization of Bt cotton which is now being planted in about 20 counties across the Country, with positive impacts to the communities.

The Authority has also accelerated the decentralization of its services to regions such as Mombasa, Busia, Namanga, Malaba, Lunga lunga and Taita Taveta, and plans to open six more border offices by 2027.

Crucial role of NBA in regulating GMOs

Abridged version of the speech by acting Chief Executive officer Nehemiah Ngetich during the launch of the 2023-2027 Strategic Plan.

National Biosafety Authority assumes a pivotal role in exercising general supervision and control over the transfer, handling and use of genetically modified organisms (GMOs).

This is done with a view to ensuring the safety of human and animal health, and the provision of an adequate level of protection of the environment. This is achieved through the application of both international and national standards on safety assessments.

The Authority is guided by the provisions of the Cartagena Protocol on Biosafety, the Biotechnology Policy, the Biosafety Act and a set of Biosafety Regulations.

The Authority is Kenya’s National Focal Point for the Cartagena Protocol on Biosafety, the global biosafety regulatory framework under the Convention on Biological Diversity.

Since its establishment, the Authority has continued to re-align its mission, policies, and strategic objectives to its vision of “A nation where genetically modified organisms (GMOs) are safe and beneficial”. This re-alignment has continued and is now cascaded to the 2023-2027 plan period.

This Strategic Plan signifies an assertion in providing quality



Ag. Chief Executive officer Nehemiah Ngetich.

service delivery and commitment to serve with integrity, professionalism, customer focus, inclusiveness and sustainability since “what is not planned, measured and timed cannot be accomplished”.

This strategic plan represents a third-generation strategy for the Authority, succeeding the partially implemented 2020-2025 plan.

The development of the Strategic Plan was informed by the need to re-align with the government’s MTP IV (2023-2027) and the Bottom-up Economic Transformation Agenda (BETA), as well as the requirement to re-align with the guidelines for development of the 5th generation strategic plans as issued by The National Treasury; State Department for Economic Planning.

This Plan has identified key achievements, challenges and lessons learnt and serves as a foundation for ensuring alignment with current government priorities and regulatory requirements.

Efforts have been made to realign the resources available to the Authority with key strategic objectives and the planned annual activities and the plan articulates the vision, mission, core values and strategic objectives.

It also outlines the strategies and activities to be implemented to give the Authority an enhanced service delivery as well as cascading of responsibilities to operational units to achieve the best and anticipated results.

The Authority has benefited from the analyses of challenges experienced in the implementation of the current strategic plan (2020-2025) coupled with the lessons learnt, which informed the design of the new strategic plan and hope to yield enhanced improvement towards attainment of its vision.

The joint analysis of the SWOT, PESTEL, and stakeholder mapping as well as identification of potential risks and strategies that have been put in place to mitigate or avoid them, gives the Authority confidence that the implementation of the 2023-2027 strategic plan will be a successful venture.

NBA to hold 13th Biosafety Conference in Naivasha

By Ouma Wanzala

The National Biosafety Authority (NBA) is set to hold its 13th Annual Biosafety Conference that will relook at progress so far made in the biosafety sector.

The conference is themed: *13 Years Later: Building Trust and Ensuring Safety of Genetically Modified Organisms.*

“The Conference will be a National dialogue on modern biotechnologies and biosafety matters,” said acting Chief Executive officer Nehemiah Ngetich.

The event which will run from 10th-12th June will be officially opened by Agriculture and Livestock Development Cabinet Secretary Sen. Hon. Mutahi Kagwe.

Some of the sub themes for the forum are; regulatory frameworks for GMO Safety which will explore the policies, laws, and institutional frameworks governing the safe development, handling, and commercialization of genetically modified organisms (GMOs).

It highlights the role of biosafety regulations in ensuring that GMOs undergo rigorous risk assessments before approval for research, release, or consumption and the discussion will cover international laws, such as the Convention on Biological Diversity and the Cartagena Protocol on Biosafety, as well as national regulatory structures that oversee compliance, risk management, and public



Mr. Jacob Mutua from the Ministry of Agriculture explains a point to members of 13th Biosafety Conference Committee during a planning meeting.

engagement.

On GMO safety assessment and product labelling, the focus will be on the scientific methodologies used to evaluate the safety of genetically modified organisms (GMOs) before their approval for research, cultivation, or consumption.

“It will cover key aspects of risk assessment, including substantial equivalence, environmental impact, allergenicity, toxicity, and long-term health effects. The discussion will highlight internationally recognized protocols and national regulatory approaches to ensure GMOs meet safety standards. The session will also elaborate the socioeconomic parameters

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“The Conference will be a National dialogue on modern biotechnologies and biosafety matters,” said acting Chief Executive officer Nehemiah Ngetich.

considered for GMO’s for environmental release and placing on the market,” reads the statement.

It will also explore the significance of labeling regulations for genetically modified (GM) products for confirmation of safety of GM products, promoting consumer choice and traceability and how clear labeling fosters public trust, market confidence, and regulatory compliance while addressing challenges such as misinformation and the balance between mandatory and voluntary labeling approaches.

The Conference will also look at collaborative approaches to GMO research and development with focus on the power of multi-stakeholder collaboration in ensuring the safe development and adoption of genetically modified organisms (GMOs).

It will highlight the role of public-private partnerships and public-public partnerships in advancing GMO research, safety assessments, and responsible commercialization through shared safety data, expertise and resources.

Additionally, the discussion will focus on how non-governmental organizations (NGOs) and county governments contribute to biosafety advocacy, policy implementation, and community awareness.

The Biotechnology advances and emerging opportunities will examine the latest advancements in biotechnology, including genome editing and synthetic biology, as well as the transformative impact of AI on enhancing research, decision-making, and productivity. Participants will also gain insights into how AI-powered data analytics are accelerating biotech research, improving crop breeding, optimizing supply chains, and enhancing biosafety monitoring.

Nurturing Biosafety awareness

By Joseph Odongo

The Bukura College biosafety sensitization initiative served as a pivotal platform for fostering knowledge transfer and shaping the mindset of future agricultural and biotechnological researchers within Kenya's dynamic biosafety regulatory environment. This strategic engagement aimed to equip students with a deep understanding of biosafety protocols at both national and international levels, thereby nurturing a cohort of informed and responsible scientific practitioners.

The interaction with students at Bukura Agricultural College underscored the significance of instilling a culture of biosafety consciousness early in the academic journey of aspiring researchers. The initiative sought to lay a solid foundation for their future endeavors in agricultural biotechnology through immersing these individuals in discussions surrounding biosafety regulations, risk assessment frameworks, and ethical considerations.

One of the key takeaways from the engagement was the palpable enthusiasm and receptiveness displayed by the students towards learning about biosafety principles. Their eagerness to delve into the intricacies of biosafety regulations highlighted a genuine interest in upholding best practices and ensuring



The interaction with students at Bukura Agricultural College underscored the significance of instilling a culture of biosafety consciousness early in the academic journey of aspiring researchers.

environmental and human safety in their research pursuits.

Moreover, the initiative provided a unique opportunity to bridge the gap between theoretical knowledge and practical application. Students were able to contextualize the importance of biosafety measures in actual research settings by integrating real-world case studies and scenarios into the educational sessions. This hands-on approach not only enhanced their understanding but also reinforced the relevance of adhering to established biosafety protocols in their future scientific undertakings.

The engagement with agricultural biotechnology students at Bukura College underscored the critical

role of mentorship in nurturing a culture of biosafety excellence. Through fostering close interactions between students and experienced biosafety professionals, the initiative facilitated knowledge exchange and mentorship opportunities that enriched the learning experience and empowered students to make informed decisions in their research practices.

The collaborative nature of the biosafety sensitization initiative also emphasized the importance of multidisciplinary perspectives in addressing complex biosafety challenges. By bringing together students from diverse academic backgrounds, including

agriculture, biotechnology, and environmental science, the initiative promoted cross-disciplinary dialogue and collaboration, fostering a holistic approach to biosafety awareness and implementation.

In reflecting on the lessons learned from engaging with agricultural biotechnology students at Bukura Agricultural College, it becomes evident that investing in educational initiatives focused on biosafety is paramount for cultivating a generation of scientifically literate and ethically responsible researchers. Equipping students with the knowledge and skills needed to navigate the intricacies of biosafety regulations,

empowers them to contribute meaningfully to Kenya's biotechnological landscape while upholding the highest standards of safety and integrity.

Ultimately, the journey of interacting with these bright minds at Bukura College serves as a testament to the transformative power of education and mentorship in shaping the future trajectory of agricultural biotechnology research in Kenya. As we continue to champion biosafety awareness and best practices within academic institutions, we pave the way for a more sustainable and ethically conscious approach to scientific innovation that benefits both society and the environment.

Leveraging Large Language Models for Automated Gene-Editing Design

By Joseph Odongo

Large Language Models (LLMs) have undoubtedly revolutionized the field of artificial intelligence, showcasing remarkable capabilities in various tasks. However, when it comes to solving complex biological design problems, LLMs often fall short due to their lack of specific knowledge in the domain. In order to address this limitation, researchers have proposed augmenting LLM agents with domain knowledge and external tools to automate and enhance the design process of CRISPR-based gene-editing experiments.

By leveraging the reasoning ability of LLMs, this enhanced



One of the key benefits of integrating LLM agents into gene-editing workflows is their ability to bridge the gap between beginner biological researchers and advanced CRISPR genome engineering techniques.

agent aims to streamline the intricate process of gene editing by assisting in selecting CRISPR systems, designing guide RNAs, recommending cellular delivery methods, drafting protocols, and designing validation experiments to confirm editing outcomes. This innovative approach not only accelerates the research process but also serves as a valuable resource for non-expert researchers looking to conduct gene-editing experiments from scratch.

One of the key benefits of integrating LLM agents into gene-editing workflows is their ability to bridge the gap between beginner biological researchers



National Biosafety Authority technicians in a laboratory.

and advanced CRISPR genome engineering techniques. These agents provide automated guidance and recommendations which empower researchers with limited experience in molecular biology to navigate the complexities of gene editing with greater confidence and efficiency.

However, as we delve deeper into the realm of automated gene-editing design, it is essential to consider the ethical and regulatory implications associated with this cutting-edge technology. The rapid advancement of LLM agents in the field of biological research raises important questions regarding the responsible and transparent use of these tools.

Ethical considerations surrounding automated gene-editing design primarily revolve

around issues of consent, privacy, and potential misuse of genetic information. LLM agents gain access to sensitive genetic data and contribute to decision-making processes in experimental design, ensuring that researchers adhere to ethical guidelines and prioritize data security becomes paramount.

Regulatory frameworks must evolve alongside technological advancements to address the unique challenges posed by automated gene-editing design. Establishing clear guidelines for the use of LLM agents in research settings, defining boundaries for data sharing and collaboration, and implementing mechanisms for accountability are crucial steps towards promoting ethical practices in gene editing.

Despite these challenges, the integration of LLM agents

in automated gene-editing design holds immense promise for advancing biological research and unlocking new possibilities in precision medicine and biotechnology. Researchers can explore complex biological discovery tasks with unprecedented speed and accuracy through harnessing the computational power of LLMs.

The synergy between LLM agents and automated gene-editing design represents a significant milestone in the realm of molecular biology. By addressing ethical considerations, embracing transparency, and leveraging the potential of advanced AI technologies, we can pave the way for a future where gene editing is not only more accessible but also conducted with integrity and respect for ethical principles.

Shaping Kenya's GMO research for a resilient tomorrow

By Bernard Apiri

The world is on the brink of a biotechnology revolution and Kenya stands at the forefront of this transformation.

As climate change, pests and diseases threaten agricultural productivity, genetically modified organisms (GMOs) present a lifeline offering higher yields, improved resistance and enhanced nutritional value. Yet, the promise of biotechnology must be met with responsibility, safety and public trust. At the heart of this delicate balance is the National Biosafety Authority (NBA), Kenya's guardian of biosafety and innovation, ensuring that GMO research thrives within a framework that safeguards human health, animal health and the environmental integrity.

NBA's role extends far beyond regulation; it is the architect of a future where Kenya harnesses the full potential of genetic engineering while maintaining rigorous safety measures. Established under the Biosafety Act of 2009, NBA is mandated to oversee the transfer, handling and use of GMOs, ensuring that science serves humanity without compromising ethical or environmental values. Through robust scientific risk assessments, NBA has created a structured yet enabling ecosystem for biotechnology research to flourish.

With Kenya's Vision 2030 prioritizing agricultural transformation, NBA has aligned its strategy with national development goals. By streamlining approval processes for GM research applications and collaborating with leading research institutions such as the Kenya Agricultural and Livestock Research Organization (KALRO) and local universities, NBA has accelerated groundbreaking research in staple crops like maize, cassava and cotton. These innovations not only promise food security but also position Kenya as a biotechnology powerhouse in Africa.

However, scientific progress is only as strong as the infrastructure supporting it. Recognizing this, NBA has established a fully standardized laboratory for the rigorous testing of GMO samples collected from various Points of Entry/Exit (POEs), market surveillance activities and research institutions. Additionally, NBA continues to invest in capacity-building initiatives, equipping scientists, policymakers and regulators with the expertise to uphold the highest standards in genetic engineering and biosafety assessment.

Despite remarkable strides, GMO research in Kenya faces a formidable challenge; public perception. Fear, misinformation and skepticism often cloud the true potential of biotechnology.

Recognizing this, NBA has intensified public engagement efforts, rolling out nationwide awareness campaigns, stakeholder consultations and transparent communication strategies. By fostering dialogue with farmers, consumers and traders, NBA is building a culture of trust, where decisions are informed by science rather than speculation.

Beyond Kenya's borders, NBA continues to play a crucial role in international biosafety discourse. By working closely with the East African Community and global frameworks like the Cartagena Protocol on biosafety, NBA ensures that Kenya remains compliant with international standards while leveraging global expertise. These strategic partnerships enhance regional harmonization of biosafety regulations, facilitating safe cross-border trade in genetically modified products.

The future of GMO research in Kenya is not just promising; it is inevitable. NBA stands as the pillar of this transformation, ensuring that Kenya's journey in biotechnology is scientifically sound, ethically grounded and globally competitive. Through robust regulations and strategic collaborations, NBA is shaping a tomorrow where genetic advancements drive food security, climate resilience and sustainable economic growth.

What inspections at the confined field trials is all about

By Ruth Okong'o



National Biosafety Authority Board of Directors visit to a Bt Cotton farm in Uyoma Siaya County.

The mandate of the National Biosafety Authority is to assure and ensure the safe development, transfer handling and use of genetically modified organisms (GMOs) with the aim of protecting human and animal health as well as the environment from possible adverse effects of GMOs. Therefore, Confined field trials (CFT) are part of the GMO development phase that enable researchers to collect additional safety data that cannot be generated at the lab or greenhouse levels.

They are small scale, controlled and monitored field experiments that are vital for evaluating specific genetically engineered traits, agronomic performance, potential environmental impact, and safety of GMOs.

To exercise its mandate the Authority closely monitors activities at confine field trials

to ensure compliance to the Biosafety Act of 2009 and the Contained use regulations, 2011. The Inspections are normally undertaken with relevant regulatory authorities depending on the nature of the trial. For plants-based trials, Kenya Plant Health Inspectorate Service-KEPHIS is the relevant agency whereas Directorate of veterinary services-DVS is involved in animal-based trials (domestic).

Inspections of CFTs are key for the following reasons;

- They prevent unintended/accidental release of the GMOs by enforcing standard operating procedures-SOPs and protocols that ensure proper disposal of plant/animal materials as well as prevent escape of GMOs from the designated trial site.
- Inspections of CFTs safeguard public health; this is because they ensure that safety

measures are taken to protect workers. The biosafety inspector/officer will ensure that all personnel handling GMOs are adequately trained on biosafety matters and are using personal protective equipment (PPEs)

- Safeguarding the environment; during inspections biosafety officer checks for the effectiveness of the physical barriers such as the fence, 24/7 guarding of the facility to prevent unauthorized entry, login books, and implementation of the spatial isolation to prevent cross pollination with conventional varieties and wild relatives.
- They facilitate collection of scientifically sound, consistent and unbiased data that informs the Authority's decision making and approval processes. This is because the trials are conducted using approved experimental

protocols and data collection methods.

- Compliance with regulatory requirements; inspections enable the inspector to verify adherence of CFTs to approval conditions issued by the Authority, the Biosafety Act of 2009 and Contained use regulations, 2011.

CFT inspections are normally carried out at four levels;

- Pre-trial inspection of sites to ensure they meet all the required conditions to undertake a GMO research. This includes checking for the containment measures/strategies in place such as the physical barriers to prevent accidental release/escape of GMOs. CFTs are only undertaken in NBA approved sites.
- Commencement of the trial; during planting or vaccine trials, an inspector ensures adherence to containment measures, submitted SOPs and protocols. They also ensure safety of the workers by ensuring they are using proper PPEs.
- Termination of the trial; this is mostly during harvesting to ensure proper disposal of GMOs as per the submitted protocols and prevent accidental release/escape of the same through thorough supervision
- Post-harvest inspections to ensure post-harvest monitoring is undertaken and that all emerging volunteers post the trial period are removed and properly disposed.

Risk assessment and what it entails

By Ouma Wanzala

Genetically modified organism (GMOs) before being commercialized usually undergo a rigorous assessment and review to ensure that they pose no increased risks to the environment compared to conventional crops.

Speaking during the 2nd Global Congress on Genetic Biocontrol Technologies, in Accra, Ghana, National Biosafety Authority (NBA) Acting Director of Biosafety Research and Compliance Josphat Muchiri observed that risk assessments must be carried out in the context of safeguarding broad national protection goals based on national policies and laws.

Muchiri told the participants drawn from Africa and across the globe that Kenya has put in place appropriate measures while assessing risks in GMOs products before placing on the market.

“The move is to ensure safety of human, animal health and protection of the environment,” said the acting director.

He added that the robust regulatory framework guides us on how to conduct risk assessments for genetically modified organisms.

In his presentation dubbed ‘Risk assessment and Risk Management Frameworks for Gene Drive Research’, Muchiri said the Authority conducts risk assessment on GMOs applications it receives in order

to identify and evaluate the potential adverse effects of living modern organisms (LMOs) on the conservation and sustainable use of biological diversity in the likely receiving environment, taking also into account risks to human health.

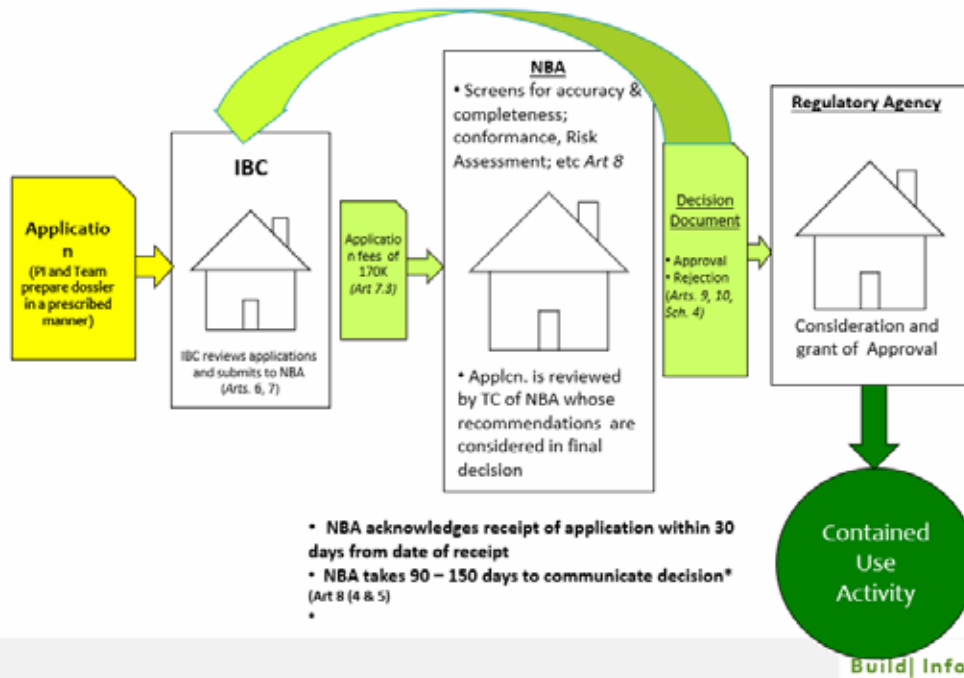
The Acting Director explained that, that GM animals are animals that have been genetically modified for a variety of purposes in ways that do not happen naturally adding that majority of GM animals are still under research stage, with only a few commercially released such as the Salmon fish and GM mosquitoes. In Africa, no genetically modified animal has been commercialized to-date.

“A lot of progress already made in GM crops, with more than 30 GM crop species already commercialized globally and cultivated in 29 countries,” added Muchiri.

He explained that testing of GMOs follows a stepwise process, starting with laboratory experiments to general release progressively with the information collected in lower levels informing the progression of the research to higher tiers. The World Health Organization (WHO) also advocates for tiered testing of GM animals in the following 4 phases, with direct human exposure increasing from Phase I to Phase IV;

In Phase one is laboratory studies, followed by indoor cages testing, phase two is confined field trials or small-scale isolated

Summary of approval process for contained use



releases, Stage three is staged open releases/ Environmental release while Stage four is post release monitoring and surveillance.

Muchiri highlighted some of the internationally accepted safety assessment instruments for GMOs such as the Cartagena Protocol on Biosafety, OECD Guidance document, Codex Guidelines, and the WHO guidance framework for testing genetically Modified Mosquitoes, second edition- 2021.

Kenya signed Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) in 2000 and ratified it in 2003 with National Biosafety Authority designated as the national focus point.

This is an international agreement which aims to ensure the regulation of GMOs to ensure their safety to humans, animals and environment.

The Protocol is part of the global convention on biological diversity (CBD) and provides a framework for the utilization of

modern biotechnology while also recognizing the potential risks that may be posed by the new technologies.

Agriculture Cabinet Secretary Hon. Mutahi Kagwe has emphasized the critical role being played by National Biosafety Authority as part of the international obligations that the country has placed on it.

The Authority is mandated to ensure safety of human and animal health and provide adequate protection of the environment from harmful effects that may result from GMOs.

Kenya has approved several genetically modified organisms (GMOs) crops for confined field trials across the Country. The field trials are; Bt maize in Kiboko and Kitale, drought tolerant maize in Kiboko, Virus Resistant Sweetpotato in Kakamega, Virus Resistant Cassava (VIRCA) in Mtwapa, Thika and Alupe, BioCassava Plus (BC+) at Alupe in Busia County, GM potato at

KALRO, Molo in Nakuru, Muguga in Kiambu County and Njabini, Nyandarua county.

Others are; Bt Cotton which has since been completed in Mwea, Kirinyanga County, Water Efficient Maize for Africa (WEMA) and African Biofortified Sorghum (ABS) in Kiboko, Makueni County.

The Authority has already approved the commercialization of Bt Cotton, which has been in cultivation since 2020 and no adverse effects have been noted or reported through the Authority's monitoring and surveillance system. Other crops such as Bt maize and virus resistant cassava are at advance stages of variety testing towards their commercialization

However, this month, the Court of Appeal sitting in Nairobi has suspended further approvals for cultivation and importation of GMOs until the appeal case is heard and determined. However, research activities and those already commercialized will continue.

NBA in briefs

Compiled by Ouma Wanzala

NBA embarks on awareness creations across the Country

The National Biosafety Authority (NBA) has lined up a series of engagements with County governments in the Country as it seeks to strengthen public education and combat widespread misinformation around genetically modified organisms (GMOs).

Already public awareness have been conducted in more than 10 counties

among them Trans -Nzoia ,Busia, Vihiga, Nandi , Bungoma, Kisii, Homa Bay, Bomet among others.

More Counties are set for such engagements with the Authority next financial year.

Speaking during the launch of NBA Strategic Plan 2023–27, Agriculture Principal Secretary Kipronoh Ronoh underscored the importance of

creating public awareness on biosafety and GMO-related science, especially among farmers and consumers, noting that many remain skeptical or misinformed about the safety and benefits of biotechnology.

The Strategic Plan outlines key measures to enhance public awareness and education on biosafety.

NBA determined to deliver on its mandate

The National Biosafety Authority has assured Kenyans that it will continue to undertake its mandate of general supervision and control over the transfer, handling and use of genetically modified organisms (GMOs) in order to ensure safety of human and animal health and adequate level of protection of the environment is provided.

Speaking in Naivasha during a team building exercise for board members and management, acting

Chief Executive Officer Nehemiah Ngetich observed that the Authority is entrusted with a crucial responsibility—to safeguard the interests of the public by ensuring biosafety compliance and upholding the highest standards in its service delivery.

“Through this exercise, I hope we will all gain valuable insights, build stronger bonds, and emerge more committed to our shared vision and goals,” said Ngetich.

He said Kenya has regulatory framework which provides for a streamlined process for companies and organizations seeking to import GMOs and its derived products and outlines specific application requirements, safety assessments, and monitoring measures.

“This procedure aligns with Kenya’s commitment to food safety, environmental safeguards and the economic welfare of its citizens,” said the acting Chief executive officer.

NBA to support tree planting initiatives in schools

National Biosafety Authority (NBA) has announced plans to partner with more schools across the country in the ongoing national tree growing restoration campaign.

Speaking at Loresho Primary School during a tree planting exercise in collaboration with Kenya Forest Research Institute, the Authority’s acting Chief Executive officer Nehemiah Ngetich said the move will ensure that the Country achieves target forest cover by 2032.

“We are proud to be part of this exercise that is being spearheaded by the national government led by H.E President Dr. William Ruto to have 15billion trees planted by 2032,” said Ngetich.

He disclosed that the Authority as part of the initiative has already planted trees in a number of Primary schools in Meru County, Kiambu County and now in Nairobi with



National Biosafety Authority Ag. Chief Executive officer Nehemiah Ngetich plants a tree with a pupil from Loresho Primary School in Nairobi County. The exercise is part of national tree growing restoration campaign, which is being championed by the government of Kenya with a target of 15billion trees by 2032.

National Biosafety Authority Ag. Chief Executive officer Nehemiah Ngetich(right) and Loresho Primary and Junior School head Mr Mwangi Mbuthia(left) together with pupils during a tree planting exercise in Nairobi.

more school targeted in the next quarter.

“We appreciate the management of Loresho Primary School for accepting to host us in this important national exercise,” said Ngetich during the exercise that saw a total of 1,000 trees planted.

Out of the 1000 trees that were planted 500 were assorted trees while 500 were fruit trees.

“I urge you learners to take care of these trees as they will provide you with shelter and fruits in future as well as conserve the environment,” added Ngetich.

NBA partnership to support young scientists

National Biosafety Authority (NBA) has partnered with Scientist of Kenya Association (SCOKA) on various initiatives to support young people interested in Biotechnology and Biosafety in the Country.

NBA acting Chief Executive officer Nehemiah Ngetich observed that understanding biosafety is important for future scientists and responsible citizens.

“Let’s explore science responsibly and contribute to innovation. As a regulator, the NBA recognizes the importance of involving youth who are engaged with current biotechnologies,” said Ngetich during a forum on Science, Technology, Engineering and Mathematics (STEM) challenge for future innovation that was presided over by Spouse of the Deputy President Dr. Joyce Kithure at Daystar University in Machakos County.

Dr. Kithure had earlier on visited the National Biosafety Authority booth in order to understand the mandate of the Authority which is to exercise general supervision and control over the transfer, handling and use of Genetically Modified Organisms (GMOs) with a view to ensuring safety of human and animal

health and provision of adequate protection of the environment.

The event was attended by hundreds of students in secondary school and who also participated in an innovation contest.

Ngetich took the students through career courses related to the Authority’s work among them: biotechnology researcher, environmental scientist, food safety officer, biosafety inspector and science communicator.

He emphasized to the participants the crucial role played by the Authority ensuring the safe use of modern biotechnology in Kenya and regulating genetically modified organisms (GMOs) to protect human health, animal health and the environment.

“Biotechnology can improve agriculture, medicine, and industry. Without proper regulation, GMOs may pose environmental harm, unintended health effects, and ethical concerns and therefore NBA ensures that biotechnological advancements are safe and beneficial to Kenyans,” added Ngetich.

On the Authority’s role in science and innovation, Ngetich said the agency encourages safe research

and development in biotechnology and biosafety, provides guidance to researchers and institutions on safety protocols, ensuring responsible innovation and works with universities, research institutes, and industry stakeholders in realizing its mandate.

He added that the Authority has a duty to protect Kenyans by ensuring that GMO food and products are tested and safe, monitors environmental impacts of biotechnology and engages scientists, policymakers, and the public in decision-making.

Kenya signed Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) in 2000 and ratified it in 2003 with National Biosafety Authority as the national focus point.

This is an international agreement which aims to ensure the regulation of GMOs to ensure their safety to humans, animals and environment.

The protocol is part of the global convention on biological diversity (CBD) and provides a framework for the utilization of biotechnology while also recognizing the potential risks that may be posed by the new technologies.

Review of the Biosafety Act kicks off



Stakeholders during the review of Biosafety Act meeting in Machakos County.

The National Biosafety Authority has embarked on the process to review its Act through minor amendments.

With the involvement of other stakeholders, the Ministry of Agriculture, the Office of the

Attorney General, Kenya Plant Health Inspectorate Service (KEPHIS), the Biosafety Appeals Board, National Commission for Science, Technology and Innovation (NACOSTI) and State Corporations Advisory Committee (SCAC), the Authority seeks to come

up with an Act that will encompass emerging modern biotechnology.

Speaking during the forum, National Biosafety Authority acting Chief executive officer Nehemiah Ngetich reflects the shared commitment to ensuring Kenya’s biosafety

framework remains robust, adaptive, and forward-looking.

“We are gathered to consult and build consensus on the proposed amendments to the Biosafety Act, Cap 320. This law, enacted in 2009, laid a strong foundation, but much has changed since then. Science has advanced, technologies have evolved, and our legal frameworks must keep up,” said Ngetich.

He said the the current law focuses narrowly on genetically modified organisms noting that modern biotechnology has moved beyond that, thus tools like genome editing and synthetic biology must be included within the scope of our regulation.

“The Act was passed in 2009— before the 2010 Constitution. We need to bring it in line with the

constitutional framework that now guides governance, public participation, and devolution. We must also align the Act with current judicial interpretations to avoid ambiguity and strengthen legal certainty,” Ngetich.

He said a detailed gap analysis was carried out by the Authority’s technical and legal teams which identified areas of potential revision.

Complaints Handling Committee equipped with skills on its operation



Members of the Complaints Handling Committee follows proceedings during their training by officers from the Commission on Administrative Justice (Ombudsman) on how to handle complaints at the Authority.

Complaints Handling Committee at the National Biosafety Authority has been sensitized on effective public complaints management and access to information Act.

The 10-member Committee were taken through the training by experts from Commission on Administrative Justice (Ombudsman) who underscored the importance of the Committee in handling

complaints at the institution.

The team was taken through the mandate and function of the Office of the Ombudsman, effective complaints handling mechanism, procedure has and best practice, dealing with challenging behavior when handling complaints and procedures of handling the complaints

The members were also taken

through access to information legal framework, roles and responsibilities of the IAOs, limitation of the right of access to information and performance measures, implementing the resolution of public Complaints indicator for the 2024/2025.

The Committee is now expected to come up with complaints policy in order to guide its activities at the Authority.

PICTORIALS



National Biosafety Authority staff follow proceedings during ISO recertification Audit by KEBS.



Contract staff and interns during their induction at the National Biosafety Authority boardroom.



A team from NETFUND after a meeting with NBA officers.



Officers from NBA and Kenya Association of manufacturers (KAM) after a consultative meeting on how to work together.



Team building exercise



NBA Board of Directors Chairperson Prof Jenesio Kinyamario speaks to participants during a team building exercise in Naivasha.



National Biosafety Authority Staff during a sensitization meeting on mortgage scheme by Mr. Nicholas Njehiah from Kenya Commercial Bank. The Authority has partnered with the Bank to provide mortgage to its staff.



National Biosafety Authority(NBA) Staff during ISO recertification by Kenya Bureau of Standards(KEBS) .



Ouma Wanzala from National Biosafety Authority during a visit to a Cotton farm in Siaya County.



Members of Busia border traders in Busia during a visit by NBA Board.



NBA Board member and head of delegation Mr. Mohamed Hussein addresses Committee members of One Border Stop Point in Busia during a consultative meeting.



NBA Board Member Mr. Asteri Angolo and Corporation Secretary Mr. Moses Sande listens to presentations during a visit to Busia border point.



Strategic Plan launch.



Editorial Team

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