African Genetic Biocontrol Consortium

GenBio News

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Image Source: African Genetic Biocontrol Consortium

Group photo of the 3-day training workshop held in Nairobi, Kenya.

NEW TOOLS FOR RISK ASSESSMENT AND THEIR APPLICATION

African Genetic Biocontrol Consortium Holds a Training Workshop On New Tools for Risk Assessment and their Application in Decision-Making Process for Testing and Deployment of New and Emerging Genetic Biocontrol Technologies

The African Genetic Biocontrol Consortium continues to provide a platform for interaction among African experts and institutions to enhance opportunities for technical capacity strengthening, knowledge exchange and deliberation about the challenges and opportunities of genetic biocontrol technologies for the public good, which will strengthen African influence on their development and provide critical input for decision-making by product developers, policy makers, and other stakeholders.

During a training workshop held from 16th to 18th July in Nairobi, Kenya, participants who were a select group of African biosafety regulators were taken through an introduction to risk assessment and associated methods (qualitative and quantitative), in the context of genetic bio-control. The workshop comprised of a mixture of presentations provided by members of the Commonwealth Scientific and Industrial Research Organization (CSIRO) Data61 Environmental and Ecological Risk Assessment (DEERA) team. Additionally, target participants were engaged in hands-on exercises to provide practical experience and further insight into the issues and methods highlighted in the presentations.

Risk assessment is the process of collecting and critically reviewing data for the identification and quantification of risks resulting from any activity that may pose threats to the environment, animals, and people. Risk assessment is an important aspect of genetic biocontrol research and it is often carried out at key stages of the research. It is imperative to engage with stakeholders and communities to help in defining values and preferences of genetic biocontrol technologies. For instance, before any environmental release of an engineered gene drive mosquito could be considered by regulators, decision-makers and stakeholders, environmental risk assessment (ERA), whether probabilistic, qualitative, or a combination thereof, must be conducted to evaluate potential risks to human health, animal health and the environment. Additionally, a requirement for an effective environmental risk assessment of genetically modified organisms is to define intended and unintended effects of the intervention on target organisms and non-target organisms.

Selected participants in this workshop were taken through comprehensive topics on risk assessment such as Introduction to risk, risk assessment frameworks and methods; Qualitative risk assessment; Introduction to probabilistic risk assessment; Simple statistical models and elicitation; Process-based models in risk assessment; and Scientific quality criteria - what to look for in a risk assessment. In addition to the presentations, participants were given an opportunity to engage in hands-on group activities in the three-day workshop including Exploring linguistic uncertainty; Case study in problem formulation and conceptual models; Subjective probability defining discrete and continuous cases, conditional probability tables, simple Bayes net; Case study on formal elicitation using Indirect; and Review risk assessment for release of OX513A in Grand Cayman.

On the final day of the workshop, participants were given an opportunity to give presentations on their country experience on requirements, regulations, risk assessment frameworks, and decision-making process for genetic biocontrol products. The essence of this exercise was to share country experiences in Africa to identify gaps and provide recommendations in regard to the development of genetic biocontrol technology. Participants gave a positive review of the three-day workshop and resolved to act as focal points in their respective countries in the assessment and identification of new tools that may be adopted in strengthening the decision-making process for genetic biocontrol products in Africa.

Facilitators taking participants through engaging group activities during the workshop.

Outcome of Participants' Group Activities

Workshop participants were tasked with individual exercises, where they were required to make presentations on the following areas:

- Discuss the current Risk Assessment framework and Decision-making process for Genetically modified organisms/GM Biocontrol agents in your country.
- Assess and identify the new tools that may be adopted to strengthen the decision-making process for genetic biocontrol products in Africa.
- Discuss how the current framework can be improved to include Quantitative Risk Assessment.
- Identify gaps for improvement in the current procedures/ guidance used in your country.
- Thoughts about the workshop/ recommendations for a way forward in the African continent.

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The groups reported back on how new tools may be adopted to strengthen the decision making process for genetic biocontrol products in Africa. Regarding how the current framework can be improved to include quantitative risk assessment, the groups indicated that there is need to combine the use of quantitative and qualitative risk assessment, employ models as part of risk assessment, use probabilistic approach to risk assessment, and enhance capacity for effective communication to minimize linguistic uncertainty.

Existing gaps identified by the groups in the decision-making process for genetic biocontrol products included a lack of capacity to conduct assessment of GMOs due to limited human and infrastructural resource, poor communication between GM regulators and decision makers, lack of regional harmonization, and few accredited laboratories and institutions in the region to undertake risk assessment.

The group activities provided recommendations and way forward in the African continent such as developing partnerships for capacity building in the use of quantitative and qualitative risk assessment, training to enhance the capacity of scientists and researchers in development of quality proposals that can enhance RA and/or attract funding, generating and packaging data guided by standard protocols that supports decision making, developing SOPs and guidelines to effectively utilize the identified tools, developing harmonized SOPs and guidelines to promote region-wide decision-making, and training to enhance awareness of decision makers on the applicability of the new tools.

Formation and Participation in Committees

A resolution made from this training workshop was the formation of committees.

Some of the committees formed include:

Risk Assessment and decision-making Committee

The risk assessment committee will spearhead discussions and development of best practice guidance and consensus documents.

Spearhead by

Public Engagement and Communication

The public engagement and decision-making committee will help create awareness and generate support for consensus building on public engagement among the relevant stakeholders including the indigenous people and local communities (IPLCs).

Youth Forum Committee

The youth forum committee will give youth a voice in the planning of activities and programs on genetic biocontrol technologies for their communities and to provide information to adults making decisions that affect their lives.

Women in Genetic Biocontrol Forum

The women in genetic biocontrol committee will provide an opportunity for women involved in science, academia, students, and industry to meet, network, and learn about current research, development, and deployment of genetic biocontrol technologies.

Regulatory Committee

The regulatory committee will assist the Steering Committee to oversee and make recommendations in relation to consensus documents, education, awareness and communication programmes on regulatory and policy matters relating to genetic biocontrol in the African continent.

Testimonials from the Workshop Participants

Charles Mugoya, Uganda, Uganda Virus Research Institute (UVRI)

"The workshop has been a good experience because we've been discussing a very important aspect of risk assessment. Gene drive is one of the new tools that promise to help in solving some problems we have in our crops, livestock, and humans. Right now, we are doing the build-up to use this tool in solving the problem of Malaria"

Professor Abraham Anang, Ghana, Noguchi Institute for Medical Research

"In this workshop I have benefited tremendously because the qualitative risk by itself is a new approach to do risk assessment that allows us to be confident about what we are communicating to the public."

Dr. Hinda Doucore, Mali, Applied Molecular Biology Laboratory, Mali

"I would say that it was fantastic, during the 3 days, we learned quite a lot of new information, for example the evaluation of the quantitative and qualitative risks and application to emerging technologies. Overall, the Workshop was very informative for me"

Etienne Bilgo, Institut de Recherche en Sciences de la Santé (IRSS), Burkina Faso

"I will say that this training was extremely beneficial for me as well as for my Institute and country. Thank you, I really learned a lot from this special training specifically in the use of quantitative tools for risk assessment"

A COURTESY VISIT

From front left Silas Obukosia (AUDA-NEPAD), Brinda Dass (FNIH), David O'Brochta (FNIH), and Willy Tonui (GenBio-Consortium).

GeneConvene team pays a courtesy visit to African Genetic Biocontrol Consortium and AUDA-NEPAD offices

The GeneConvene team represented by Prof. David O'Brochta and Dr. Brinda Dass paid a courtesy visit to the Consortium and AUDA-NEPAD office following the "Training Workshop On New Tools for Risk Assessment and their Application in Decision-Making Process for Testing and Deployment of New and Emerging Genetic Biocontrol Technologies" held from 16th to 18th July, 2022 in Nairobi, Kenya. Dr. Brinda Dass is the Scientific Program Manager and Policy Lead for Gene Drive Research whereas Prof. David O'Brochta is the Scientific Program Manager and Technical Lead for Gene Drive Research for the Foundation of National Institute of Health.

During this visit, the Consortium, GeneConvene and AUDA-NEPAD team discussed points of synergies in their mandate and activities to see better ways of working in a complementary fashion. GeneConvene advances best practices and informed decision making for development of genetic biocontrol technologies to improve public health. GeneConvene offers technical information, advice, training and coordination for research on gene drive and other genetic biocontrol technologies. The mandate of AUDA-NEPAD is to coordinate and execute priority regional and continental projects to promote regional integration towards the accelerated realization of Agenda 2063; and strengthen capacity of African Union member states and regional bodies, advance knowledge-based advisory support, undertake the full range of resource mobilization and serve as the continent's technical interface with all Africa's development stakeholders and development partners.

The Steering Committee Chairman pays a Courtesy visit to the Consortium Secretariat

The steering committee chairman, Dr. Misheck Mulumba paid a courtesy visit to the Consortium Secretariat on July, 2022. The purpose of his visit was to discuss progress and achievements of the consortium in the first two quarters of 2022. A key point of discussion was the Annual Performance Plan 2022/23 for the African Genetic Biocontrol Consortium. The plan has been developed in accordance with the mandate of the Consortium Charter and the Strategic Plan 2021-2023 "Strategy for Collaboration Towards Expanding the Development and Use of Genetic Biocontrol Approaches in Africa."

The Plan sets forth the Consortium's long-term six outcomes of the 2021/23 Strategic Plan and it details the inputs, activities, and outputs of the set targets. The Consortium pursues these outcomes through annual performance goals that are set out each year and published in the Annual Performance Plan. The Consortium reports on its performance against the annual performance goals in its Annual Report.

The Steering Committee commits itself in monitoring performance and implementation of the targets set out in this Plan. The assessment and monitoring of the annual performance are done on a Quarterly basis and is approved by the Steering Committee.

Message from the Steering Committee Chairman - Dr. Misheck Mulumba

Dr. Misheck Mulumba, Chairperson – AfOHNet and Chairman of the Steering Committee – African Genetic Biocontrol Consortium gives a brief introduction about the Consortium and the importance of One Health.

The video interview transcript is available below:

Would you please give a brief introduction about yourself and your role in the Consortium?

The main objective for establishment of the African Genetic Biocontrol Consortium is to provide a platform for interaction among African experts and institutions to enhance opportunities for technical capacity strengthening, knowledge exchange and deliberation about the challenges and opportunities of genetic biocontrol technologies for the public good. This we believe will in turn strengthen African influence on their development and provide critical input for decision-making by product developers, policy makers, and other stakeholders

What is the importance of a consortium and how does it benefit organizations in Africa like AfOHNet?

Each of the different members of the consortium cannot and do not have enough reach on the continent, expertise and also they prioritize gene biocontrol to different extents according to their field of expertise. The bringing together of all these members therefore creates synergies among and affords a

platform to consortium members to share ideas and experiences on different genetic biocontrol initiatives in their respective fields.

What is one health and its importance?

The (One Health High-Level Expert Panel) OHHLP definition of One Health (OH) is "a collaborative, multi-sectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment." In AfOHNet we strongly believe that the concept of One Health should be addressing real OH challenges facing the community the benefits of which must be clearly tangible to them. We therefore focus on the practical low hanging fruits of OH in African communities.

What is genetic biocontrol and how is it different from other control measures that have been used in the past?

I like Teem's definition: Genetic biocontrol can be defined as the release of organisms with genetic methods designed to disrupt the reproduction of invasive populations for example the use of Pseudacteon species against red imported fire ants.

Would you please give a brief description of the African One Health Network and the role it plays in implementing one health in the African continent?

Across the African continent, multiple national and regional One Health initiatives and networks have been developed to address the health risks and threats posed by the ever changing interactions between humans, animals and the environment. These networks have mobilized scientists and policy makers to improve disease surveillance, outbreak preparedness and response, and information sharing, but are not well integrated with each other. The ultimate role of AfOHNet is to bring a coordinated response to improve coordination and communication between One Health networks with the mission of strengthening disease detection, diagnoses, and reporting.

What was the main motivation for AfOHNet to join the Consortium?

As AfOHNet we recognize the niche in which we operate and the capacities and limitations of our network. Being a member of the Africa Genetic Biocontrol Consortium helps to bring synergies of other actors in the One Health and gene biocontrol space for accelerated implementation of various initiatives.

Could you please comment on some of the milestones and achievements made by the African Genetic Biocontrol Consortium since its inception.

First of all:

- The mere fact that the consortium has been able to bring together the following members AfOHNet, Africa Biological Safety Association (AfBSA), the Multilateral initiative on Malaria (MIM), Network of African Science Academies (NASAC) and the Pan African Mosquito Control Association (PAMCA) is a major achievement in itself. These consortium members have come to appreciate the work done by their counterparts and in so doing have avoided costly duplication of projects while contributing to genetic biocontrol efforts in their different niches.
- The Consortium has an informative, interactive and updated website covering matters genetic biocontrol. (www.genbioconsortium.africa)
- The Consortium consistently produces weekly and monthly newsletters to keep our audiences informed and updated.
- The Consortium has also witnessed a tremendous growth in social media outreach especially through Twitter. You can reach us through the Twitter handle: @AfricaGeneBio.
- The consortium had hosted a number of successful and very informative webinars on various topics of interest whose attendance and participation bears witness the interest in the consortium's activities.

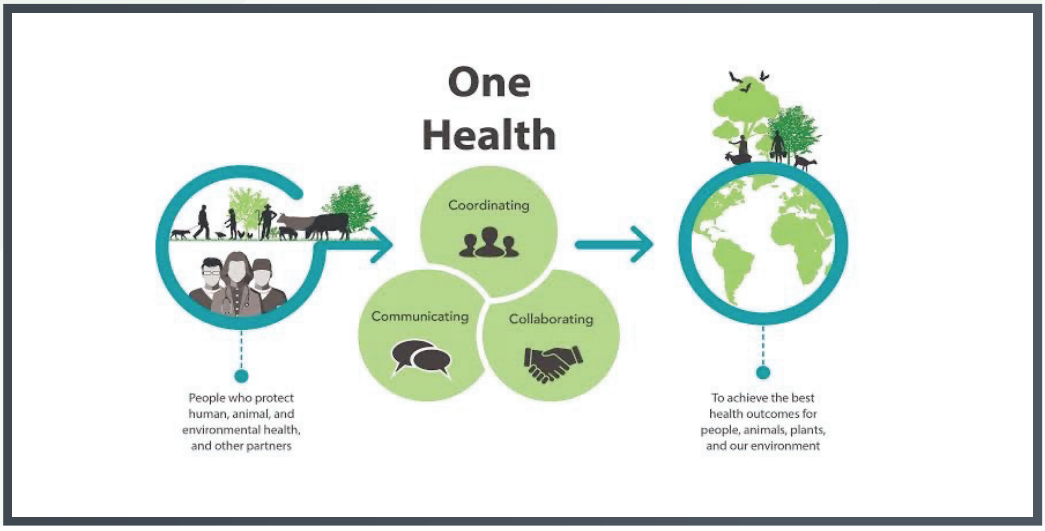
Would you please provide more information on the upcoming Inaugural African One Health Network Workshop in Ghana?

The Inaugural Africa One Health Network (AfOHNet) Workshop 2022 will provide AfOHNet members a Pan-African networking opportunity for multi-disciplinary engagement with a mission of strengthening disease detection, diagnoses, and reporting in African nations collaborating across the continent. The Workshop will include a mixture of keynote panel presentations, dedicated thematic sessions, and lively discussions and debates on the challenges that impact building an integrated, non-duplicative One Health scientific network by sharing best practices and lessons learned from established One Health initiatives across the continent. The 5-day conference will also include a hackathon, breakout workshops, and working group panels to enrich regional collaborations, networking, and encourage and promote a new generation of young One Health leadership across Africa.

ONE HEALTH HIGH-LEVEL EXPERT PANEL is "a collaborative, multi-sectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment."

In conclusion, what would be your message to anyone who would like be part of AfOHNet, what would be your call to action to them?

Issues of One Health have developed from the narrow narrative encompassing zoonotic diseases to include human, animal, plant and planetary health. They now affect all of us on the planet. For us as a continent to contribute to mitigating against the adverse effects of several factors affecting One health we must first understand what One Health is, realize where our contribution can be made while ensure proper coordination among amongst the multiplicity of both local and international One Health initiatives set up in different communities, countries and regions on the continent. AfOHNet offers the opportunity to network with other One Health actors on the continent, streamline line their various interventions to avoid duplication and help coordinate the activities. So if you are interested in playing a part of addressing the challenges of One Health on the continent there can never be a better platform for you to do so than by joining AfOHNet. The workshop will be held in Accra Ghana from 3-7 October 2022.



YOUTH INITIATIVE

Establishment of a Youth Initiative to Support Genetic Biocontrol Programmes in Africa

There is need for introducing training programmes with exclusive focus on the topic of genetic biocontrol for early career

Africa is the world's youngest continent, as the proportion of youth among the region's total population is higher than in any other continent. In 2010, 70 percent of the region's population was under the age of 30, and slightly more than 20 per cent were young people between the ages of 15 to 24. The socioeconomic conditions of young Africans have improved in recent years, but not considerably. There has been an increase in school enrolment over the past 20 years, and the gender gap in education has narrowed, however, young Africans continue to face major difficulties in the realms of higher education, employment, health, and participation in decision-making processes. There is need for introducing training programmes with exclusive focus on the topic of genetic biocontrol for early career graduate and post-doctoral scientist working on insects, plants, fish, mammals, and other organisms in Africa. As such, the Consortium aims to bring together young researchers on topics ranging from discovery research, technology development, moving existing technologies to the field.

Genetic biocontrol is an approach for controlling or eliminating specific organisms that threaten public health, food security and biodiversity that uses genetic variants (natural, induced, or transgenic) of the target species as the controlling agents to affect the target species in ways that reduce its undesirable impacts. Robust transgenic and genome editing technologies are fueling expanding research and development of genetic platforms and systems for combating pathogen and parasite-transmitting mosquitoes, plants and insects that reduce food security, and invasive species that are destroying biodiversity.

Activities of the Youth Initiative for Genetic Biocontrol

- Holding workshops at meetings/conferences to provide an opportunity for the youth to interact and network with professionals in the biosciences field.
- Providing tips on job opportunities and writing a (successful) grant proposal.
- Offering mentoring opportunities with conference buddies/ mentor for first timers at main conferences.
- Using the Consortium's website and newsletters to advertise relevant job opportunities, PhD, and Post-doc positions.
- Hosting webinars targeting early career scientists on a monthly basis.

YOUTH FOR GENE EDITING GROUP

YOUTH FOR GENE EDITING

Twitter: @youthgeneKE

Youth for Gene Editing is a platform for engaging and empowering youths in Africa towards Biotechnology and Biosciences for better stewardship. Our main focus is on emerging biotechnologies such as gene editing. Genome editing technology is applied in studying gene function, human disease research, gene therapy, livestock and crop genetic improvement. As such, we believe that such a platform for communicating gene editing is imperative in providing knowledge on gene editing, its regulatory aspects, and enhancing ways of communicating the technology.

The group primarily comprise of postgraduate students in the biosciences. Planning of activities such as webinars and in-person workshops is shared among selected members with the aim of enhancing publicity and reach to large number of youth as possible. Presently, the youth group has hosted two webinars, which have performed well in terms of attendance and engagement.

Webinar 1: June 15, 2022

Speaker: Dr. Eric Magembe, International Potato Center (CIP): *The science of gene editing and its potential applications.*

Webinar 2: July 27, 2022

Speaker: Dr. Valentine Ntui, International Institute of Tropical Agriculture (IITA): *Applications and Major Achievements of Genome Editing in Banana and Plantain Improvement.*

The next webinar is scheduled for September, 2022.

Webinar 3: September 14, 2022

Speaker: Dr. Martin Bundi, Kenya Medical Research Institute (KEMRI): *Review process of Biotech Applications in Kenya.*

Members Corner: Africa One Health Network (AfOHNet)

About the African One Health Network

One Health employs a multidisciplinary approach to address the interactions the health risks and threats posed by the ever changing interactions between humans, animals and the environment. AOHN aims to improve coordination and communication between One Health networks with the mission of strengthening disease detection, diagnoses, and reporting. We aim to strengthen One Health implementation across the African Continent by sharing best practices and lessons learned from established initiatives.

Supporting One Health

Issues of One health have gained center stage in the recent past, and justifiably so. The world is witnessing an increase in pathogen spill overs from animals to humans. These spill overs are driven in large measure by human actions such as population growth, encroachment on wildlife habitats, agriculture intensification and more efficient transport systems that allow people and cargo capable of carrying pathogens fomites to move between regions in a short space of time. These actions have resulted in changes to the environment which has impacted climate change and contributed to zoonotic disease emergence and re-mergence. Indeed, it has been estimated that up to 70% of all emerging and re-emerging infections in humans are of animal origin. The SARSCoV2 infection that causes COVID 19 is just but one of many such infections.

One health employs a multidisciplinary approach to address the interactions the health risks and threats posed by the ever changing interactions between humans, animals and the environment. Surveillance leading to early detection, diagnosis and prompt reporting of disease events has been recognized as key to the effective control of zoonotic diseases. Global One Health security agenda promoted by the World Health Organization (WHO), World Organization for Animal Health (OIE) and many other international organizations recognizes One Health as a major component to the attainment of UN Sustainable development goals.

Across the African continent, multiple national and regional One Health initiatives and networks have been developed. These networks have mobilized scientists and policy makers to improve disease surveillance, outbreak preparedness and response, and information sharing, but are not well integrated with each other. To bring a coordinated response to one health challenges on the continent, African researchers and scientists met in Johannesburg, South Africa in February 2018. The meeting was facilitated by the US Defense Threat Reduction Agency and endorsed by the World One Health Platform founders. Participants were drawn from all parts of the continent. The meeting culminated into the formation of the Africa One Health Network (AOHN).

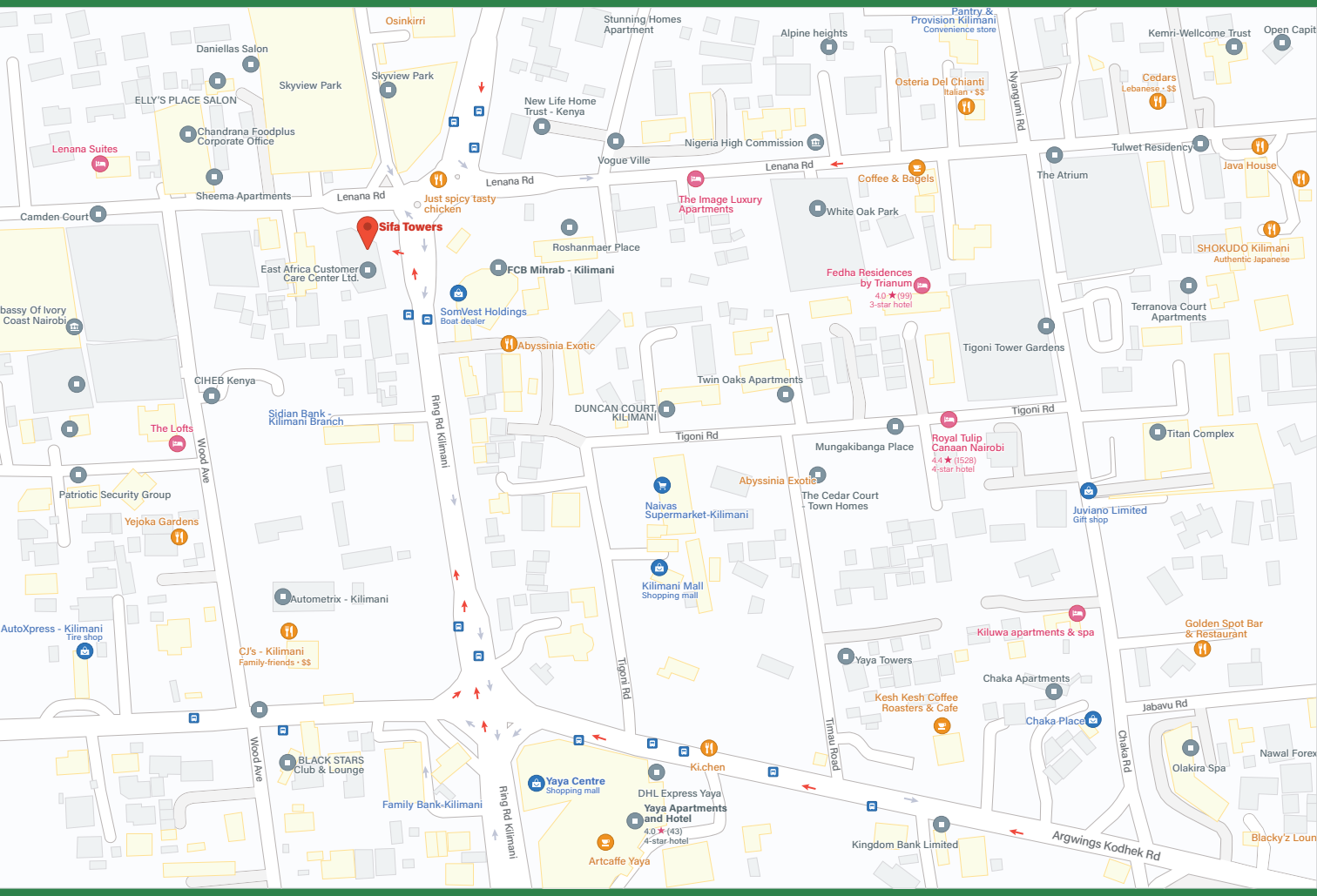
Find out more about AfOHNet: https://afohnet.org/

ONE HEALTH HIGH-LEVEL EXPERT PANEL

Food and Agriculture Organization of the United Nations
WORLD ORGANISATION FOR ANIMAL HEALTH
UN environment programme
World Health Organization

African Genetic Biocontrol Consortium

Where to find us



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