

Bioeconomy: A Potent Strategy for Addressing Biosecurity threats in Africa

Introduction

Compelling research evidence have been able to establish that climate change hazards such as drought, flooding, sea level rise, desertification, loss of biodiversity and increase in human population either directly or indirectly threatened world biosecurity. Climate change affects vector-borne diseases by directly affecting the transmission dynamics, geographic spread, re-emergence of vector-borne disease through multiple pathways including direct effects on pathogens, vectors, non-human hosts, and humans. Frequent infectious diseases outbreaks that promptly spread across continents in the last decade has shown that, world health system is becoming more complex. Health challenges in one part of the world can spread to another continent rapidly, causing significant loss of lives and economic loss. The lockdown during the COVID-19 pandemic prevented trade and commerce between countries which impacted severely on global economy.

It is important for governments at all levels across the globe to develop an efficient biosecurity and biosafety frameworks to address the present and prevent future infectious disease outbreaks. Utilization of the environment in a more sustainable and friendly manner is a project for everybody especially the government that has the major responsibility to secure the environment. In response to any outbreak, countries usually engage in an aggressive genomic surveillance, rapid diagnostic testing, vaccine manufacturing, genomic sequencing, and provision of personal protective equipment. This development stimulates an increase in number of biotechnology and genomic facilities. For example, the ongoing COVID-19 pandemic has highlighted significant contribution of biosecurity management and also the creation of economic opportunities during the disease outbreak.

The need to ensure sustainable development, economic growth and safe biotechnology research in a safe ecosystem has necessitated the promotion of a concept and policy strategy called BIOECONOMY. According to FAO, Bioeconomy refers to as knowledge-based production and utilization of biological resources, processes, and principles to sustainably

provide goods and services across all economic sectors. This concept has capacity to ensure food security, improved health, development of agro-biobased factories, connect famers to bio-entrepreneurs and creation of new clean sustainable bioenergy while protecting the environment. Bioeconomy is a concept that can address biosecurity threats and stimulate economic growth without negatively impacting the ecosystem.

Global bioeconomy summit, 2020 critically reviewed and analyzed a decade of bioeconomy policy development around the world. Nearly, 60 countries around the world are pursuing bioeconomy-related policies to stimulate, support and steer transformation dynamics towards a sustainable economic growth. New dynamics in bioeconomy policy development are evolving outside of governments, with stakeholder-driven and industry-driven strategies on the rise.

Private sector is very instrumental to the success of the bioeconomy initiative. The sector has engaged bioeconomy strategy to addressing emerging biosecurity threats. For example, most of the bioeconomy elements that form the basis for biosecurity success are produced by private sector. The biosecurity successes recorded in most infectious disease outbreaks as demonstrated by the ongoing COVID-19 are enhanced by four major bioeconomy elements. These four elements are: 1. Licensed Laboratories for detecting, characterising, and mapping of pathogens, 2. Development of Biosecurity equipment (personal protective equipment PPE, Ventilators, face masks etc), 3. Manufacturing of Vaccine, therapeutics and 4. Data technologies and Biosecurity infrastructure. These elements are largely provided by private sector, and it contributed to the economy in most countries.

In addition to bioeconomy being a potent strategy to address biosecurity challenges, it has also generated wealth in the economy of the countries that has adequately adapted it. Private sector in Africa has not been a major partner in bioeconomy strategy in the region. While COVID-19 pandemic in Africa clearly showed the impact of joint effort between private sector and government in addressing the outbreak, most of the previous outbreaks in Africa such Ebola, Lassa Fever demonstrated how the governments were overwhelmed by independently tackling the health challenge.

In recognition of this development, Global Emerging Pathogens Treatment Consortium (GET), has taken the initiative to engage scholars to inform and educate the world especially Africa, on why bioeconomy should be central to government biosecurity agenda in Africa

Challenges confronting bioeconomy development in Africa

Over the decades, the emerging concept of bioeconomy has gained substantial recognition as a major pillar of support for economy and biosecurity in Europe and North America. African governments have not maximized bioeconomy strategy to combat biosecurity threats in their region. Some of the factors limiting Africa from harnessing bioeconomy opportunities are:

1. Inadequate policies and strategies in most African countries that support bioeconomy transformation.
2. Limited funding of research and development is a major bane of growth of bioeconomy in Africa. Few Countries in Africa, for example South Africa, Kenya and Tunisia that allocates above 2.5% of budgetary allocation to research are occupying leadership positions in Bioeconomy in Africa
3. Biotechnology elements of bioeconomy have not been fully harnessed due to biotechnology infrastructure deficit in most African countries.

Recommendations

South Africa is taking a leadership position in bioeconomy initiative in Africa. The government has published the “South Africa Bio-Economy Strategy” to foster the transition towards a knowledge-based bioeconomy. East Africa came together to develop a regional innovation-driven bioeconomy strategy that enables the pooling of resources to address shared regional priorities. Other African countries and regions should also leverage on bioeconomy for sustainable economic growth and development. The following are recommended to enhance development of bioeconomy in Africa:

1. African governments should integrate bioeconomy into his existing range of continental and regional developmental agendas such as AUC AGENDA 2063, STISA 2024, ECOWAS VISION 2050.
2. African researchers, scientists, and other relevant stakeholders should harness and sensitize the region on biobased technologies and solutions that possess the capacity to ensure food security, climate change adaptation and mitigation, and biosecurity threat reduction. There is an urgent need to unlock the value-added chains of food crops, livestock, forestry, marine and aquatic resources, and microbial products to create further wealth through biobased inputs. Biobased pesticides and fertilizers

derived from plants and microbes should be enhanced to compete at international market.

3. Africa government should encourage and support research in indigenous biobased pharmaceutical, biobased cosmetics, and other well-being products. Traditional medicine utilizes indigenous knowledge on local biodiversity to provide affordable health for wide range of rural dwellers
4. African leaders should make conscious effort to promote and support Science Technologies and Innovation (STI) in the region. The region is behind in the application of STI to revamp agricultural production, bioprocessing and bioresources for economic development.

Conclusion

Africa government must leverage on the opportunities in bioeconomy to address the challenges of food insecurity, climate change and biosecurity threats facing the continent. It is important to develop policies and strategies that support bioeconomy development in Africa.

About GET

Global Emerging Pathogens Treatment Consortium (GET) was established in 2014 as a direct response to the 2014-16 Ebola virus disease outbreak in West Africa and ongoing outbreaks of Lassa Fever, Meningitis, Multidrug resistance (MDR) enteric fevers and COVID-19 across the sub region. There was clearly a need to create an African-led multidisciplinary forum of experts capable of working together with international partners to strengthen Africa's preparedness and resilience in tackling such infectious disease outbreaks caused by emerging pathogens, public health emergencies and pandemics.

GET found the understanding of biosecurity to be a very underdeveloped area on the continent with clear opportunities for using biosecurity to dramatically improve on capacity for prevention and medical countermeasures during public health crises. GET now operates firmly in the African Biosecurity and pandemic preparedness space, and functions as a think tank, providing high level advocacy and operational and necessary expertise to support Countries and communities achieve improved resources to combat outbreaks and other public health emergencies that can threaten stability, peace and security thereby undermining economic growth and well being. The consortium is working with international collaborators with a goal of providing strategic recommendations and establishing infrastructure and research capacity to respond to highly infectious emerging Pathogens such Ebola and ongoing COVID-19 Pandemic. The Consortium creates a rapid informed

response strategy and provides advice and guidance to African countries, and a point of reference for international funding and aid agencies