

Professor Akin Abayomi Talking points.

What is biosecurity: It is the responsible custodianship of the biosphere.

The United Nations Food and Agriculture Organisation define biosecurity in the context of a strategic and integrated approach that encompasses the policy, regulatory frameworks, instruments and activities for analysing and managing relevant risks to human, animal and plant health, and associated risks to the environment. Biosecurity covers food safety, zoonosis, the introduction of animal and plant diseases and pests, the introduction and release of living modified organisms (LMOs) and their products (e.g. genetically modified organisms or GMOs), and the introduction and management of invasive alien species. Thus biosecurity is a holistic concept of direct relevance to the sustainability of agriculture, and wide-ranging aspects of public health and protection of the environment, including biological diversity.

Biosecurity thus means different things to different disciplines:

- **Laboratory Biosecurity:** Prevents loss, theft, misuse, diversion or intentional release of pathogens or toxins.
- **Medical Biosecurity:** Ensures systems are in place to equip the medical fraternities' ability to respond to biological threats through well prepared personal, operating in accredited facilities and medical countermeasure protocols in order to minimize morbidity and mortality. This includes the means to conducting research especially during a biological threat caused by a high consequence pathogen that may be unknown or have limited treatment modalities available. Such research must happen under appropriate governance structures.
- **Food and Agriculture:** Manages biological risk in the food, plants and environmental sectors. Essentially it is a holistic concept to ensure sustainability of agriculture and food security.
- **Environmental Biosecurity:** Includes plant pests, zoonosis, genetically modified plants and their products, management of invasive alien species and genotypes and the protection of biodiversity and the environment.
- **Animal Health Biosecurity:** Ensures the creation of barriers to limit the opportunities for infected animals or their products to enter uninfected sites and ensure safe animal protein for consumption.
- **Life Sciences Researcher:** It means responsible conduct of research and accountability to society.
- **Security Agencies:** To ensure systems are in place to assess risk and take counter measures to eliminate potential hazards.
- **Legislators:** Ensuring the laws of the land are constantly updated to adopt international treaties and to keep abreast of biotechnological developments.
- **Rapid Respond and Medical Emergency Preparedness agencies:** Protocols are in place to rapidly respond to biological threats when they occur with a multi sectorial organised approach
- **Public Health:** Ensure that early warning systems are in place through integrated disease surveillance mechanisms to identify and predict likely emerging hot spots.

An integrated biosecurity framework is therefore multi-dimensional and requires high level coordination in order to protect a countries way of life, natural productive resources and biodiversity from harmful effects of pests, diseases, toxins and technology that threaten to corrode the wellbeing of society. It thus goes without saying that biosecurity is an essential part of sustainable development and national security.

Man is having an increasing impact on the earth with dramatically changing population demographic profiles and the over utilisation of nature's resources some of which have finite supply such as fresh water, fresh air and biological species.

Increasing industrialization over the past 200 years has seen humanity accelerate science and technology, resulting in what is understood now as the 4 stages of industrial development culminating in the current dispensation known as the fourth industrial revolution or the 4IR. The 4 stages of the industrial revolution have been coupled with the ethos of capitalism and exploitation which aspires to maximize profits at the expense of humanity and the environment thereby creating even more insult to the biological systems of nature.

All stages of the dynamic transformation of man's ability to manipulate his environment has brought both tremendous benefit and challenges. Many of these challenges threaten the biosphere and the immediate ecosystem in which we are so intimately connected to and dependent upon for health, harmony and survival. If we continue to interrupt nature's way of providing renewal and deep cleansing of the biosphere we set up vicious cyclical currents that result in biological threats and ecological instability due to loss of nature's intrinsic control mechanisms.

Nature has its own way of relieving the pressure we apply on it and when it does the impact on humanity can be devastating.

In my presentation I will give examples of the biological catastrophes that have taken place during the last millennium as we have traversed through the first, second and third industrial revolutions. These insults on the environment are perpetuating themselves with cumulatively ramifications and in themselves setting up new threats to biological integrity.

We are just entering what we now call the Fourth Industrial Revolution characterised by the fastest pace of biotechnological advances in the history of mankind. The ability to manipulate the very codes of life that have taken thousands of centuries to find balanced equilibrium and delicate interdependencies is likely to have very major consequences if not governed and managed with extreme oversight and responsibility. This is likely to be an impossible expectation as many of such biotechnological advances such as gene editing and gene drive technology are easily and readily available to scientists who may be operating without appropriate oversight and due diligence. The probability of harm caused by dual use technology has never been higher. The risk of creating uncontrollable biological entities is extremely concerning particularly in a world that is still plagued with political unrest and regional conflict.