# Role of Bio-Innovation and Biodiversity for Africa

***Excellencies***

***Distinguished guests***

***Ladies and gentlemen***

***Organisers of this conference***

**Good morning**

**It is a pleasure and privilege to address the Global Bio-economy Summit on the Role of Bio-innovation and Biodiversity in Africa.**

**As a scientist, not to mention the former President of a Small Island Developing State, I recognize that there is no greater set of issues for people individually and for humankind collectively.**

**As we all know, the world is facing grave threats to its biodiversity -- Africa more than anywhere.**

**African species are disappearing at almost twice the global rate, driven by habitat loss, the introduction of non-native species and human development.**

**In fact, Sub-Saharan Africa is projected to lose up to 30% of its species of flora and fauna by the end of this century -- a result of climate change, population growth and under-regulated development.**

**This catastrophic convergence of events has been caused directly and indirectly by human behavior, which includes extraction, deforestation, poaching and agricultural industrialization.**

**Particularly threatened are Africa's freshwater ecosystems.**

**You are aware that the management of climate change, like the management of biodiversity preservation, represents a complex interdependence of many factors, touching upon aspects of the environment, local cultures and the economy.**

***Ladies and Gentlemen:***

**Economic modeling of the impact of climate change on Africa predicts a mean average global temperature rise of 1.5°C by 2040, with costs equivalent to 1.7% of Africa's GDP.**

**As the mean temperature rises 2.2°C by 2060, economic costs increase to the equivalent of 3.4%.**

**By the end of the century, with a mean temperature rise of 4.1°C, the economic costs are equivalent to just under 10% of the Continent's GDP.**

**Civil society has recognized for decades if not longer the need to slow the loss of biodiversity especially in Africa.**

**Progress in Africa on achieving biodiversity goals generally parallels progress in the rest of the world, which I might characterize as some measurable achievement, but not nearly enough.**

**A periodic status report of progress against the Aichi targets known as the Global Biodiversity Outlook tells us that Africa lags behind the rest of the world in terms of improving knowledge and dedicating financial, institutional and technical resources to mitigate the decline in biodiversity.**

**Africa also lacks appropriate and harmonized biodiversity indicators to assess conservation needs and progress against goals and suffers from data and information deficiencies.**

**Also identified as a material weakness is the dearth of readily available information on Africa's biodiversity, which presents a barrier to accurately assessing the status, trends, threats, and conservation needs for biodiversity in Africa.**

*Ladies and Gentlemen:*

**If chemistry and physics drove the industrial transformations of the 20th century, I am convinced that biology promises to generate the most ground breaking technological applications in the 21st century.**

**For example, In India, biotechnology is one of the fastest growing knowledge based sectors in its emerging economy generating about 11BN USD in revenues during the 2015-16 fiscal year.**

**And, with a favourable business and regulatory environment to support this growth, the biotechnology industry revenues are projected to accelerate to a compound annual rate of 30.5% to reach 100BN USD by 2025.**

**Notwithstanding this challenge, Africa enjoys some unique advantages in its potential to open up new applications that drive prosperity for the Continent.**

**In addition to its 'youth dividend' and the increasing talents of this growing number of young people, Africa's unique traditional knowledge presents the promise to lead to advances in areas ranging from agriculture to medicine to information technology and beyond.**

**Areas like biopharmaceuticals, bioagriculture and bioservices will potentially drive the biotech sector significantly.**

**Innovations in biotechnology can also be used to reduce carbon emissions and otherwise promote environmental conservation efforts.**

**Using microbes, oil-based raw materials in the plastics industry can be replaced with more ecofriendly raw materials like sugars.**

**Bioremediation applying the use of bacteria like Pseudomonas and Mycobacterium can be put to use to treat sewage especially within a framework of an increasingly urbanized Africa.**

**Similarly, environmental hazards including oil spills can be mitigated by the application of this technology.**

***Ladies and Gentlemen:***

**The challenges are fundamental, starting with inequalities in education, which leave millions of people unprepared to contribute to and reap rewards from the modern economy.**

**On a macroeconomic level, Africa remains stubbornly dependent on short-term aid, undermining the obligation of our governments to create conditions that attract and nurture private investment and venture capital.**

**This in turn dilutes our ability to set our own agenda and take control of our own economy. Yet the challenges that the continent faces can be turned into opportunities.**

**The impact of climate change is already acute in Africa.**

**Droughts, heat stress and flooding have led to a reduction in crop yields and livestock productivity, and to the destruction of homes, shelters and villages across the Continent.**

**Observable effects on water resources include flooding, drought, change in distribution of rainfall, drying-up of rivers, melting of glaciers and receding bodies of water.**

**A United Nations report predicts that access to water may be the single biggest cause of conflict and war in Africa in the next generation.**

**Conflicts over resources in turn exacerbate environmental impacts contributing further to ongoing migration within and between countries in Africa.**

**Climate change and biodiversity loss and their impact on agriculture and therefore food security add urgency to our fight against poverty and disease in Africa.**

**Yet technology now exists to make crops more viral-resistant or drought-resistant through gene-splicing sprays.**

**The CRISPR technology now provides an alternative approach for improving the genetic traits of plants that is easier and generally cheaper than traditional breeding techniques.**

**Rapid innovations such as these have the potential to improve the lives of people through advancement in areas such as agriculture, environmental conservation, healthcare and disease prevention, big data-driven bioinformatics and industrial biotechnology.**

**Agricultural biotechnology can help meet the world's food supply needs as population increases.**

**Scientific advances have produced new genes that can fortify crops to withstand natural calamities such as pests and diseases (including crops like Bt cotton) and provide higher nutritional value (as with golden rice).**

**The twin fields of genomics and bioinformatics are similarly poised to revolutionize healthcare by coupling the advances of biotechnology with the collection and analysis of huge volumes of genetic and biological big data.**

**Moreoever it is time to test individual proclivities of Africans is different than that of people with other genetic heritages, and that therefore populations can react differently than each other to the same drugs.**

**That is why it is important to include more and more people of African ancestry in drug trials. It is time to test individual proclivities of African for certain diseases and to tailor treatments for specific needs.**

**Big data can help researchers and pharmaceutical companies monitor the efficacy of drugs.**

**The broad elements of healthy, diverse diets, seed and crop diversity, improvements in seed and crop delivery and cultivation, and the maintenance of our agrobiodiversity must be optimized to ensure a healthy and prosperous future for all our people.**

**Evidence that the wisdom of these investments is strong and growing, so we must continue to invest in in order to improve Sustainable Food Systems to meet many of our Sustainable Development Goals.**

**At the same time as we modernize, we must support traditional knowledge systems, such as those related to sustainable agriculture.**

**Among the features of this preservation are enlightened agriculture and trade policies, intellectual property rights on the conservation and sustainable use of biological resources, the empowerment of women as guardians of these systems,**

**and the equitable sharing of benefits across sectors, genders and communities.**

**As an academic who spent much of her career in academic science, I feel a special obligation to build a rhetorical bridge between our environment and scientific research.**

**The vital threats of biodiversity loss and climate change are themselves nested in the drive to advance human health and wellbeing.**

**And the effectiveness of driving human health and wellbeing is correspondingly leveraged by a continued investment in research and innovation.**

**Our very existence sits at the nexus of not just the interdependent, trans-disciplinary nature of scientific research, but in a broader context, at the intersection of nutrition, health, agriculture, environment, governance and the economy.**

**These investments require sustained operational funding and capital support and the capacity to engage successfully with funders, governments, policy makers and communities.**

**Only significant and simultaneous investment in the many elements of environmental preservation and scientific research – public-private investment in basic and applied**

**research, building access to sustainable resources, creating the legal, regulatory and policy conditions to encourage research in and for sustainable economies, enlightened policy development, and innovative training here on the Continent -- will create the robust conditions that lead to the deceleration of biodiversity loss, a slowing rate of climate change, less disease, more prosperity and more independence in Africa.**

**This research is not an "expense", but an "investment."**

**These opportunities and their complexities will have impacts well beyond our political lifetimes – indeed, beyond the actual lifetimes of anyone on Earth today.**

**The world is tackling the challenges of maintaining biodiversity and decelerating climate change, but the tradeoffs that they require inevitably pit one country's interests against another's.**

**Small island states like Mauritius, five of which are part of the African continent, have unfortunately been the first to reach the tipping point where the theoretical effects of dependence on the extractive industries take a measurable, tangible toll on our very existence.**

**I hope therefore that it is from our nations, that a true, Africa-wide environmental movement will take hold.**

**We must bring all possible human and financial resources to bear on fighting climate change, protecting our biodiversity and creating a better Earth for peoples everywhere.**

**The challenge is not easy: reaching it depends on the contributions of highly-skilled individuals from everywhere in the world, political courage and foresight, and creative, ambitious innovation.**

**But it *can* be done, because it *must* be done.**

**Our ability to create a sustained future for ourselves isn't optional: it's existential.**

**But before I close, I would like to share with you an innovative project currently being run out of Mauritius.**

**A project where Africans who have been excluded from the financial sector and have lacked open access to global commodity markets, can ambition to move out of poverty and hopefully enjoy a higher standard of living.**

**With the UWIN (Unleashing the wealth in Nation), a project coming out of the MIT, we want to put in place a next generation market place infrastructure that provides access via emerging technologies such as mobile-based apps, blockchain, big data, cloud storage and a digital asset trading**

**floor to provide for price discovery, supply and demand matching and a marketplace liquidity.**

**This pilot ambitions to make a significant contribution to meeting the world's financial inclusion goal set by the UN and other multilateral agencies and organization.**

**It should promote the empowerment of women as more women gain access to co-ownership of property and other assets.**

**It would also help mitigate food insecurity by empowering the youth into 'agritech' and using predictive data analytics.**

**The policy paper has received the support of the WIPO and in Mauritius I am putting the database on traditional knowledge that I had developed nearly 20 years ago for this pilot project.**

**There's an African proverb that says, "The best time to plant a tree was 20 years ago. The second best time is now." Bring your seedlings and your shovels, and we will plant that tree together.**