Grand Challenges Rwanda

Towards Research and Innovation Excellence

PROGRAM

LAUNCH OF GRAND CHALLENGES RWANDA

"Supporting research and development (R&D) through cooperation to promote excellence and scale of evidence-based innovations"

KIGALI CONVENTION CENTER (KCC)
KIGALI, 18TH -19TH MAY 2023

AUDA-NEPAD
AFRICAN UNION DEVELOPMENT AGENCY

ncst
National Council for Science and Technology

SCIENCE FOR AFRICA
FOUNDATION

INTRODUCTION

About Grand Challenges Rwanda Launch

Welcome to Rwanda at the Kigali Convention Center (KCC).

The 18th-19th May 2023 marks an important milestone to launch Grand Challenges Rwanda program at Kigali Convention Center (KCC), Kigali, Rwanda. Our goal is to support the most creative scientists in Rwanda to collaborate with their partners in Africa and globally, to implement research that fosters innovation in solving the most critical development challenges in Rwanda and Africa.

Goals:

- Discuss strategies to support R&D and innovation pipeline through novel ideas and innovative solutions addressing national and African development challenges;
- Assess and support innovations to mature and transition to scale, be commercialized to improve the quality of living standards of Africans;
- Share strategies to strengthen sustainable national and international partnerships and cooperation in scientific research to promote excellence and scale of evidence-based innovations for national, and continental economic growth and prosperity,
- Shape sustainable solutions for funding R&D-based innovations through continued financing prioritization, advocacy, dissemination and commitment to fundamentals of accountability and good governance,
- Launch a request for proposal (RFP) to solicit applications from scientists in Rwanda to collaborate with their partners in Africa and globally, to implement research that fosters innovation in solving the most critical development challenges.

Expected Outcomes:

- A request for proposal (RFP) is launched on research that fosters innovation to solve the most critical development challenges in Rwanda and Africa;
- One-year prioritized action plan for driving sustainability of Grand Challenges Rwanda Consortium-related efforts;
- A summary of strategies to support improved R&D and innovation funding towards AU target of 1% R&D funding as a percentage of national GDP;
- A broad network of African and global partners established to share ideas and resources to advance R&D and innovation development agenda to promote scientific research excellence and scale and make valuable contributions to society.

BACKGROUND

The Government of Rwanda through National Research and Innovation Funds (NRIF) and other funding mechanisms continues to fund research and development (R&D) to build research and innovation excellence. The goal is to enhance data-driven innovations to transform industrial development and improve the well-being of Rwandan citizens.

Grand Challenges was established in 2003 by the Bill and Melinda Gates Foundation at World Economic Forum in Davos, Switzerland to fund ground-breaking scientific research on specific unique health challenges in a country using bold mind ideas and innovative solutions.

Several African countries such as Ethiopia, South Africa, Senegal and Botswana have launched Grand challenges. Science for Africa Foundation (SFA) based in Nairobi coordinates Grand challenges in Africa to develop innovations on the African continent.

African Union Development Agency- New Partnership for Africa's Development (AUDA-NEPAD) facilitated a planning meeting in Kigali on 20-21 March 2023 for Grand Challenges Rwanda Launch.

In partnership with national stakeholders, Science for Africa Foundation (SFA) and AUDA-NEPAD, National Council for Science and Technology (NCST) will launch Grand Challenges on 18th-19th May 2023.

GRAND CHALLENGES RWANDA

Rwanda is joining a growing global network of innovations to leverage efforts from members of the global Grand Challenges family. This will broaden collaborations and mutual R&D funding for groundbreaking innovative research projects. This will lead to products and services as unique solutions, and to develop innovations through research exchanges, best practices and experiences with global and African researchers.

Grand Challenges prioritize funding opportunities to high-level quality ideas by researchers and innovators with exciting groundbreaking innovative research projects leading to products and services as unique solutions. The emphasis is that research developed in partnership with industries, companies and academic institutions using highly recognized labs, industries, innovation hubs and other settings leads to products, services and knowledge and technology transfer, as well as strengthen the ties between global and African collaborators.

KEY ACTIVITIES AND THEMES

The following will be the focus of the Launch of the Grand Challenges Rwanda:

- Official launch of Grand Challenges Rwanda
- Signing MoU NCST-SFA
- Publish request for proposal (RFP)
- Keynote speeches
- Panel sessions
- Exhibition

Themes:

REMARKS

Hon. Minister of Education and Co-Chair NCST Council

Hon. Dr. Uwamariya Valentine

Minister of Education, Republic of Rwanda, and Co-Chair of NCST Council

Hon. Dr. Uwamariya leads the Ministry of Education in the Republic of Rwanda including basic education, vocational and tertiary education, and ensures the development and implementation the Ministry's overall strategic goals as elaborated in Education Sector Strategic Plan. Dr. Uwamariya obtained her Ph.D. from UNESCO-IHE and Technical University of Delft, Netherlands, in Water Science and Environmental Technology. Dr. Uwamariya has taught and conducted research at various Universities such as the University of Rwanda, and held several positions to support global and National education programs in the teaching of sciences and leading water treatment and management projects. She is passionate to promote research, technology and dissemination of findings to foster national development. As the co-chair of NCST Council, Hon. Dr. Uwamariya will provide remarks at the launch of Grand Challenges Rwanda

Hon. Minister of Education, The Republic of Malawi

Hon. Madalitso Kambauwa Wirima

Hon. Madalitso Kambauwa Wirima is a Human Resource Practitioner with over 8 years of comprehensive Human Resources and Administration experience including recruitment & retention, conflict resolution, change management, Labor Relations and Benefits Administration.

Hon. Madalitso Kambauwa Wirima has proven experience in collaborating with senior management to conduct Human Resources strategic planning in order to support and further corporate goals. While in the Private Sector, she demonstrated experience initiating cost containment strategies resulting in significant savings. She has excellent ability to address and implement strategic plans for talent acquisition, retention and succession planning. lastly, she has proven skills in labour and employment law.

Remarks by Executive Secretary NCST

Dr. Eugene Mutimura

It is my pleasure to welcome all participants to this important event at Grand Challenges Rwanda Launch at Kigali Convention center (KCC), Kigali, Rwanda.

It is our hope that we work together with all stakeholders for the Grand Challenges Rwanda program to contribute to the advancement of research and innovation development to achieve Rwanda's Vision 2050, which aspires to transform the industry for Rwanda to become a knowledge-based economy. In particular, Grand Challenges Rwanda will prioritize funding opportunities for high-level quality ideas by researchers and innovators with exciting ground-breaking innovative research projects leading to products and services as unique solutions. We are happy for Grand Challenges Rwanda to join a growing global network falling under the Grand Challenges family, as well as under the Grand Challenges Africa.

We are extremely grateful to the Government of Rwanda's commitment to supporting research and innovation through various funding mechanisms including the Grand Challenges Rwanda program, an initiative to fund Rwandan scientists to collaborate with their peers in Africa to conduct research that addresses and solves the most critical development challenges in Rwanda and Africa.

We also thank the Grand Challenges Africa through Science for Africa Foundation (SFA) for co-funding this Grand Challenges Launch, and AUDA-NEPAD for facilitating the planning meeting in Kigali on 20-21 March 2023 for Grand Challenges Rwanda Launch.

Our thanks go to the Bill & Melinda Gates Foundation (BMGF) for facilitating our participation in various Grand Challenges Events including Annual Meetings and other partnership meetings with various partners. We are open to other partnership opportunities in future to implement Grand Challenges Rwanda.

We thank our colleagues from Grand Challenges South Africa, Grand Challenges Ethiopia, Grand Challenges Botswana, and aspirants of Grand Challenges including Malawi, Uganda and Nigeria. All thanks go to the Launch organizing committee composed a team from national stakeholders, the Science for Africa Foundation and AUDA-NEPAD for the success of this event.

Finally, we would like to thank all keynote speakers and panelists who accepted our request given their busy schedules. We are happy that you make it.

We would like to assure all participants that they will enjoy a memorable Launch of Grand Challenges Rwanda and explore more partnerships.

Thank you, participants, and have a good time!

AUDA-NEPAD Representative

Professor Aggrey Ambali, PhD; FAAS

Senior Advisor at AUDA-NEPAD

Prof. Aggrey Ambali currently serves as a Senior Advisor at the African Union Development Agency (AUDA-NEPAD), where he oversees the Office of Science, Technology, and Innovation. He previously held various positions at the AUDA-NEPAD which have included Supervisor of the Technical Cooperation and Programme Fund Directorate, Director of the Policy Alignment and Programme Development, and Head of Science, Technology and Innovation Hub (NSTIH) as head of development. He also headed resource mobilization and implementation of programs in health, education and science and technology. He was the Coordinator of the African Biosciences Initiative, and Coordinator of Science and Technology for the Southern Africa region. Prof Ambali served as a Professor of Biology at the University of Malawi and is a fellow of the African Academy of Sciences.

He is currently serving on several boards and committees, including a member of the Governing Council of the United Nations Technology Bank; Jury President of the L'Oreal UNESCO For Women In Science/Sub-Saharan Africa Regional Programme; Chair of the Board of Trustees of the African Agricultural Technology Trust Foundation (AATF); Member of the Board of the Science for Africa Foundation (SFA); and Member of the Partnership for Skills in Applied Sciences, Engineering, and Technology (PASET) Research and Innovation Grants Independent Committee (GITC). He also reviews grant applications for several international funding agencies and has chaired several panels of research grants review committees.

Prof. Ambali is deeply committed to empowering and mentoring young people, recognizing that Africa's youth are indeed its future!

Chief Executive Officer, Science for Africa Foundation (SFA)

Dr. Thomas Kariuki,
CEO SFA

Dr. Thomas Kariuki is the Chief Executive Officer of the Science for Africa Foundation. The Science for Africa Foundation is a non-profit, pan-African organization, that aims to support, strengthen and promote science and innovation in Africa. The SFA foundation serves the African research ecosystem by funding excellent research and innovative ideas and building and reinforcing environments that are conducive for scientists to thrive and produce quality research that impacts development.

During his long career as a biomedical researcher and a scientific leader, Dr Kariuki has received research support from global funders such as Wellcome, BMGF, NIH, European Foundations, South-South collaborations and from local and international governmental agencies. He is a recipient of various international awards, a Fellow of the African Academy of Sciences (FAAS), Senior Fellowship of the European Foundations Initiative for Neglected Tropical Diseases, Presidential honour of the Order of Grand Warrior of Kenya (OGW) for scientific leadership and public service, Honorary Professor of Research of the Liverpool School of Tropical Medicine, LSTM. He has served on many global boards and committees of Africa-wide professional networks including the Federation of African Immunological Societies (FAIS), CEPI, WHO and others.

An internationally recognised immunologist, Kariuki leads the SFA Foundation's work to accelerate world-class research, foster innovation, and promote scientific leadership on the continent. He oversees research funding, development and commercialization of novel, high-impact science, technology, and innovative solutions for the continent. He cultivates strategic partnerships with academic institutions, governments and industry globally to transform Africa's future through science-led, knowledge-based economies. Kariuki has published widely on various R&D strategies and policy-related research and development. He is a recipient of several local and international grants, prizes and awards.

KEYNOTE ADDRESSES

Ms. Kedest Tesfagiorgis,
Deputy Director, Global Partnerships and Grand Challenges,
Bill & Melinda Gates Foundation

Prof. Alfred Bizoza,
Professor of Agricultural Economics from the University of Rwanda (UR)

Dr. Louis Kayitalire, M.D.
Chief Medical Officer, F-star Therapeutics,
Cambridge-UK and Cambridge-US

Dr. Vincent Okungu,
Career Health Economist and a researcher at University of Nairobi

Theme:"Global Grand Challenges Achievements and Prospects"

Ms. Kedest Tesfagiorgis,

Deputy Director, Global Partnerships and Grand Challenges, Bill & Melinda Gates Foundation

Ms. Kedest Tesfagiorgis leads the Global Partnerships & Grand Challenges (GPGC) team within the Discovery & Translational Sciences program at the Bill & Melinda Gates Foundation. Her career has been rooted in the conviction that, as a global community in pursuit of equity, we go faster and further by working together. Since joining the foundation in 2006, she has focused on building inclusive long-term R&D partnerships that address the biggest challenges in health and development.

Formed in 2019 and further shaped by the experience of the COVID-19 pandemic, GPGC supports innovators in low- and middle-income countries so they are positioned to lead or play a pivotal role in game changing R&D projects. The underlying rationale for this work is two-fold. First, when scientists in the geographies where most of the foundation's work will be implemented have adequate resources, the work gets done faster and better. Second, over the long term, these investments build thriving local R&D ecosystems that will set health and development agendas and drive progress in a sustainable way.

Ms. Kedest leads Grand Challenges, the foundation's flagship innovation program launched in 2003. In addition to supporting scientific projects in low- and middle-income countries directly, Kedest has helped grow Grand Challenges into a global network, working with partners across Africa and South Asia to create their own innovation programs.

Kedest sometimes describes her team's work as "Diversity, Equity, and Inclusion for Impact," and she brings her experience to bear as a co-chair of the DEI effort across the foundation's Global Health Division. Kedest also spends time on coalition-building outside of work, serving on the board of the Africa Diaspora Network & World Reader.

Theme: "Global Grand Challenges Achievements and Prospects"

Panel Discussion: Prospects for Research and innovation Development in Africa, and lessons learnt from Grand Challenges National Programs from Ethiopia, South Africa, and Rwanda

Background:

Development of research and innovation have been fundamental catalysts for creating sustainable growth and achieving industrial transition in many countries. There may be delayed impact or pay-offs from research and innovation investments but the core role of intensive research and innovation efforts provide incremental improvement in technology adoption and utilization. Grand Challenges (GC) family was created in 2003 by Bill & Melinda Gates Foundation (BMGF) at Davos World Economic Forum to address national developmental challenges by supporting research and innovative bold ideas in specific countries to support society and citizens' well-being. Overall, global Grand Challenges has been awarded several grants since 2003, both in low- and middle-income countries (LMICs) including Africa. Thus, to date global investments in Grand Challenges programs in several countries are resulting in innovations and new technology that is uplifting the wellbeing of society. These projects are either at the level of seed funding or transition to scale projects depending on national decisions and priority areas. Key priorities include but are not limited to health, agriculture, climate change or any other national priority. Most projects have resulted in the efficient creation of testing and or diagnostic technology tools, as well as health information to people in remote areas to address maternal health and non-communicable (NCDs) and infectious diseases-specific challenges.

Grand Challenges Ethiopia (GCE) is an initiative of the Ministry of Health (MoH) established in 2015 and operationalized in 2017 to address major health sector grand challenges. It mainly focuses on curbing high maternal and child mortality, weak pastoralist, adolescent and youth health, emerging and increasing trends of antimicrobial resistance and deaths due to non-communicable diseases through fostering health innovation and contributing towards the achievement of the SDGs. The source of funds for the GCE program is the Ministry of Health from the SDG pool fund contributed by different developmental partners. So far, the ministry has allocated over 3 million USD over the past five years to support innovative ideas through providing seed grants to explore proof of concept, validation test grants to test innovation or technological solutions that surfaced elsewhere in the Ethiopian context, and a transition to scale health innovation projects to end preventable deaths of children and mothers by 2030.

For example, in Ethiopia, there has been remarkable progress from Grand Challenges Ethiopia where a total of 550 health innovation project proposals were submitted following proposal call announcement over the past five years. Of the submitted proposals, 70 (52 seed, 17 transitions to scale one validation test grants) health innovation projects were selected and funded through GCE. From the 52 seed grant health innovation projects funded through GCE, 32 projects finalized first stage implementation and developed prototypes. Of these 32 seed grant health innovation projects finalized first-stage implementation phase, 17 health innovation projects with promising impact were selected on a competitive base for transition to scale 14 are currently conducting clinical safety and

performance tests. The reaming four finalized their clinical performance test and fulfilling all requirements is ready for commercialization. These innovative products are including; Infant Radiant Warmer machine for the treatment of Hypothermia, a Phototherapy machine for the treatment of Neonatal Jaundice, and Non-invasive haemoglobin measuring machines using a solar panel and battery are found to be effective and support the management of similar cases in remote rural areas including health centres rather
than management of few cases at referral teaching hospitals of district/provincial hospitals will have high impact in reducing child mortality and contributing towards SDGs.

In South Africa, the Grand Challenges program was launched in 2014 as a partnership between the South African Medical Research Council (SAMRC) and the Bill and Melinda Gates Foundation (BMGF), with a focus on health research and innovation. Since 2015, with funds provided by the Department of Health and the BMGF, GC South Africa has funded a portfolio of projects focused on addressing maternal and child health as well as antimicrobial resistance. Requests for proposals in both focus areas were coordinated with other Grand Challenges partners, namely Grand Challenges Africa, Grand Challenges Brazil, and Grand Challenges India. Several successes and lessons can be summarized. First, a local company funded through GC South Africa has developed an affordable screening test for preeclampsia, a condition responsible for at least 15% of maternal deaths in low-resource settings. The test can be used in primary healthcare settings, resulting in earlier detection of this condition, which can lead to saving lives through timely deployment of appropriate interventions. This test is now available in several countries in Africa and Asia. Second, scientists have developed an affordable and easy-to-use device for the treatment of post-partum hemorrhage, another leading cause of maternal deaths in low-resource settings. The device can be used by midwives and nurses in rural and urban areas for effective management of hemorrhage. Based on the evidence generated by the project team in South Africa, the WHO selected this device to be included in a large clinical trial to evaluate and compare its performance with two other products aimed at addressing post-partum hemorrhage in Vietnam. The third example is a simple-to-use, cost-effective, portable ultrasound device for antenatal screening of placental function during pregnancy. The device is able to distinguish between naturally small fetuses with healthy placental function, which would have been referred to higher level care unnecessarily, and pathologically small fetuses from healthy, low-risk pregnant women, which need to be referred for intervention and thereby reducing the rate of stillbirth. Reduction of unnecessary referrals reduces the patient burden and costs at higher level care, as well as patient stress; while identification of "at-risk" fetuses and subsequent intervention has been demonstrated to reduce stillbirth rates. These successes provide tangible evidence for the value of the partnerships facilitated by the Grand Challenges program.

At the end of the pannel discussion the audience will have answers to the following questions:

1. Briefly describe how Grand Challenge programs in your specific countries have contributed to improved research and innovation?
2. What have been the achievements of GC in Ethiopia and South Africa?
   - Are there challenges met?
   - How have you addressed these challenges
3. What is the overall prospects for GC programs globally, and in Africa?
4. Please provide realistic experiences to advocate and Call for Action for GC program in Africa?

Theme: "Role of Research and Development (R&D) and Innovation in Economic Growth and Prosperity of Nations"

Prof. Alfred Bizoza

Professor of Agricultural Economics from the University of Rwanda (UR)

Alfred R. BIZOZA is a PhD holder and a Professor of Agricultural Economics from the University of Rwanda (UR) with extensive academic and policy research experience in areas of Agricultural Economics, Institutional Economics of Soil and Water Conservation, Economics of Land, and Economics of Climate Change Adaptation. He has also served as the Director of Research at the Institute of Policy Analysis and Research during 2014-2017.

He served as a Senior Research Adviser for the LAND Project funded by USAID after being the Director of the Consultancy Bureau of UR. He joined Wageningen University in the Netherlands as a PhD candidate in January 2007 and completed his PhD in June 2011. He served as a Visiting Scholar at the International Institute of Agriculture (IIA), Michigan State University, USA in 2009 and at Cambridge University in 2017 for his post-doctoral research. He has combined his academic and policy research which allowed him to publish and present more than 60 research papers and to contribute to the drafting of various policies, strategies, national reports in Rwanda elsewhere in Africa. In addition to the above, Bizoza served as an Economist Board Member at the National Bank of Rwanda upon appointment by the Government's Cabinet during 2013-2018. Currently, Bizoza is also a Chair of the Board of the Zion Temple Authentic Word Ministries in Rwanda.

Theme: "Role of Research and Development (R&D) and Innovation in Economic Growth and Prosperity of Nations"

Panel Discussion: Prospects for Research and Innovation Development in Africa: Lessons learnt from other countries

Background:

Globally, research and development (R&D) is considered as a major tool for growing and improving industries through novel data and information generated primarily as technological innovations. There are basic definitions of R&D: a) Basic research research undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts; b) Applied research is an original investigation undertaken in order to acquire new knowledge, and these studies are directed towards specific, practical aims or objectives; c) Experimental development is systematic research on knowledge gained from research and practical experience producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

There are strong policies, interventions and opportunities to support research, technology and innovation development. Examples include: a) The United Nations (UN) Sustainable Development Goals (SDGs) agenda; b) The African Union (AU) 10-year Science, Technology and Innovation Strategy for Africa (STISA 2024), c) the Transform Africa Agenda 2063; d) East African Science and Technology Commission (EASTECO), and e) the recent adoption of the African Continental Free Trade Area (AfCFTA). However, investment in R&D in Africa is only 1.3% of the global R&D investment.

The UN SDG 9.5 highlights the need to enhance scientific research, and upgrade the technological capabilities of industrial sectors in all countries, particularly in developing countries. However, according to World Intellectual Property Organization's (WIPO) Global Innovation Index (GII), African countries still lack adequate technology and innovations. It appears that countries with higher research spending annually in terms of higher R&D as a percentage of GDP (Gross Domestic Expenditure) are the greatest global innovation powerhouses. Therefore, countries like Switzerland, Sweden, the US, the Republic of Korea, Singapore, Israel and others have high-tech industries as they have maintained continuous exponential increases in R&D funding over time. There is a strong positive relationship between R&D-based growth models that innovation is created in the R&D sectors, and it enables sustainable economic growth, provided that there are constant returns to innovation in terms of R&D. Evidence suggests that development of innovation, R&D expenditures and the investments in technology are premises for ensuring competitiveness and progress, and through them a sustainable economic growth[1].

Innovation development is highly associated with increased national technology capacity and industrial growth. Countries with higher industries have the opportunity of becoming global leaders in advanced manufacturing, by combining operational technologies (OT) and information technologies (IT). This creates breakthroughs innovations that enable the emergence of new business models that support product development such as green and digital transformations. For example, during COVID-19 crises, countries

[1]Maria Pece A, Simona OES, Salisteanu F. Innovation and Economic Growth: An Empirical Analysis for CEE Countries. Procedia Economics and Finance. Volume 26, 2015, 461-467 accessed at https://www.sciencedirect.com/science/article/pii/S2212567115008746

with the greatest investment and advanced R&D capacity developed faster COVID-19 diagnostics, testing as well vaccines manufacture capabilities that saved the world from the crises. Besides, China's agriculture through the use of technology provides about 25% of global food supply to her citizens and exports some food products. Singapore with small surface area has advanced R&D and innovative agriculture. Singapore uses climate-resilient, innovative and sustainable technologies for agriculture and aquaculture. It has new biotech-based foods and ingredients, underpinned by a robust future-ready food safety system. Singapore is a forerunner in sustainable urban food solutions and food safety, with adequate supply of safe food, and economic benefits from the sector.

As indicated by the World Bank (2017 and 2018) report, African countries can benchmark from the top 5 countries in R&D output based on their spending percentage of GDP. These include Israel, South Korea, Switzerland, Sweden and Japan. For example in 2018, Israel spent 4.95% of GDP on R&D, which is related to Israel's high innovation output resulting in technology driving its economic sectors' development. There is no doubt that African countries will continue to benchmark from developed countries to support researchers through private sector R&D investment tax waiver and provision of incentives to researchers as a way to recognize the role of R&D as a powerful driver of innovation. This will contribute to national economic growth, job creation and market competitiveness.

At the end of the pannel discussion the audience will have answers to the following questions:

1. Briefly describe the scope of research and innovation development in Africa compared to other countries?
2. Given the information on innovations you have supported/implemented as achievements, **what can be done in Africa differently to advance research and innovation?**
3. What can African leaders, scientists, and funding organizations do differently to leapfrog the gap of low R&D and Innovation landscape *(invest more in R&D, human resources development, greater tech infrastructure, to lead to increased innovation, and productivity, boost your business, have a competitive advantage?)*
4. Provide personal examples such as; realistic stories, experiences, advocacy and a Call for Action to advocate for improved research and innovation development in Africa.

Theme: "Prioritizing Research in Vaccine and Pharmaceutical Products and Services in Africa"

Dr. Louis Kayitalire, M.D.

Chief Medical Officer, F-star Therapeutics, Cambridge-UK and Cambridge-US

Dr. Kayitalire brings over 20 years of experience in oncology and immuno-oncology in clinical research in Europe and in the US with particular experience in new cancer therapy strategies.

Dr. Kayitalire completed his medical training at the National University of Rwanda, Butare, Rwanda, and was later an Assistant Professor in Oncology at the Paris XI University of France. After 7 yearstreating patients with cancer at Gustave Roussy Institute, a major academic cancer center in Paris-France, he moved into the research of new therapies for pharmaceutical companies and in senior positions in companies such as Eli Lilly, Celgene, Bristol Myers Squibb and F-star Therapeutics, a biotechnology company dedicated to the discovery, research and clinical development of Bispecific Monoclonal antibodies in solid tumors where he is now the Chief Medical Officer

He is an active member of the American Society of Clinical Oncology (ASCO), the American Association for Cancer Research (AACR), and the Society for Immunotherapy of Cancer (SITC).

Theme: "Prioritizing Research in Vaccine and Pharmaceutical Products and Services in Africa"

Panel Discussion: Prioritizing research in vaccine and pharmaceutical products and services in Africa

Background:

The Government of Rwanda established Rwanda Food and Drugs Authority (FDA) to protect public health through the regulation of human and veterinary medicines, vaccines, and other biological products. Rwanda is collaborating with BioNTech to start an African mRNA manufacturing facility base in Rwanda. This facility will be among the first in an African network to provide sustainable production capacity for mRNA pharmaceuticals. These efforts shall provide an opportunity for regulatory procedures to produce vaccines in Africa. In addition, Rwanda Food and Drugs Authority signed an agreement with the EU to support an enabling environment for the regulation of medicinal products and vaccines in Rwanda. Besides, in 2022, the African Union (AU) executive council endorsed Rwanda to host the new African Medicines Agency (AMA) to enable the African continent to reduce dependency on other countries for its health security. Today African nations import outside Africa over 70% of medicines, vaccines, and other health products.

Globally, the rapid advancement of research and innovation has led to improved quality and proportion of pharmaceutical products and services in high-income countries (HICs) compared to low- and middle-income countries (LMICs). Vaccine and pharmaceutical research is wide and pertains to innovative discovery, development, and manufacture of vaccines and medications by either public or private specialized organizations. Expansion of vaccine and pharmaceutical industries in many countries is associated with improved a) human skills and scientific capacity; b) technology advancement and investment in high-end pharmacology research and development (R&D); c) research infrastructure; d) specialization and well-developed good Laboratory Practice (GLP), quality assurance (QA) and quality control (QC), as well as e) advanced logistical technologies facilitated by the trade of authentic pharmaceutical products but also the circulation of poor quality medicines and pharmaceutical products across the value chain. A well-established laboratory and technology infrastructure for all stages of clinical trials research, as well as highly trained and dedicated human resources are critical to the success of vaccine and pharmaceutical research.

There are several determinants that are key to success in the development of research and innovation that prioritizes research in pharmaceutical products and services. First, advanced R&D and innovation in the pharmaceutical value chain require comprehensive regulatory systems including laws, policies and strategies around public health. These laws regulate and support the pharmaceutical value chain to ensure high quality and standards. Second, the role of the global pharmaceutical industry monopoly is based on the high development of the industry in high-income countries compared to LMICs. There are several supportive strategies available in HICs, and include: a) well-developed market and product strategy; b) revenue and target marketing strategy; and c) customer engagement and multi-channel strategies, among others. Third, existing national legislation guarantees and prevent the existence of unauthorized and illegal medicine sources, which requires effective implementation of the legislation. There are variations in each country since this may be influenced by the government's political commitment, resources as well as inter-governmental cooperation to ensure the prevention of unauthorized and illegal medicine sources.

Contextual research in Africa is required to share best practices and evidence-based policy decisions to cope-up with the immediate impact of the epidemics and pandemic, and beyond to save future generations from crises of the next pandemics. Building resilience to future epidemics and pandemics requires health and political leadership, strong commitment in terms of policy, but also robust research and development (R&D) and clinical trials implementation. Formulation of policy and strategies may go through several stages from inception, formulation, adoption to conclusion, and even in cases of inexistence of high-quality data, public health policy should be evidence-based.

The following panel of experts will provide their perspectives on sustainable solutions and strategies on how to prioritize research in vaccine and pharmaceutical products and services in Africa. The goal is to inform policy and implementation that will be done at all levels of governance including health institutions, academia, government sector and private sector and non-for-profit organizations.

At the end of the pannel discussion the audience will have answers to the following questions:

1. Provide brief introduction on what is required to prioritize R&D leading to improved vaccine and pharmaceutical products and services in Africa
2. What are priority goals for African countries to achieve better vaccine and pharmaceutical research for improved quality and proportion of pharmaceutical products and services
3. What efforts should be made to build global partnerships, relationships and potential targets through proactive sourcing and advancement of pharmaceutical industry in Africa?
4. The global vaccine and pharmaceutical industries are responsible for the research, development, production, and distribution of vaccine and medications. For example, the global pharmaceutical industry alone is estimated to be over a total of 3.42 trillion U.S. dollars. To reduce over dependance, and to improve quality of life for African citizens, how can Africa have its share from vaccine and pharmaceutical industries?

Theme: "Achievements, Challenges and Prospects of Research and Innovation Development in Africa"

Dr. Vincent Okungu,

Career Health Economist and a researcher at the University of Nairobi

Dr. Vincent Okungu is a career Health Economist and a researcher at the Department of Public & Global Health, Faculty of Health Sciences, University of Nairobi. He holds a Ph.D. in Health Economics from the University of Cape Town, South Africa.

Among other research grants, he is currently a recipient of the Calestous Juma Science Leadership Fellowship, which is funded by the Bill & Melinda Gates Foundation under the Grand Challenges Initiative. The fellowship aims to create sustainable domestic models for financing priority research and development (R&D) in Africa. He is interested in research on fostering more sustainable and locally driven public and private sector resource mobilization for health and health sector strategic planning and evaluation.

Dr. Okungu is a member of the Panel of Experts at the National Institute for African Studies (UK), where he guides discussions around sustainable health financing. He also works closely with AUDA-NEPAD on domestic resource mobilization and sustainable health financing. At the END Fund, an international NGO, Dr. Okungu is a Senior Advisor (Sustainable Health Financing) and works with public and private health sector stakeholders in Kenya, Rwanda, Ethiopia, Zimbabwe, Senegal, Burkina Faso, and Uganda, to design mechanisms for sustainable health financing. As the lead Health Economist for UNITAR, he developed and costed Rwanda's national NCD strategy to guide national investments in NCD control and prevention.

Dr. Okungu has served under the US National Academies of Sciences, Engineering & Medicine (NASEM) as a committee member tasked with producing a global report on policy options to improve healthcare quality. He is also a consultant with local and international organizations.

Dr. Okungu is passionate about the links between education and health, which he pursues by teaching and serving in an advisory capacity on the Boards of local primary and secondary schools in western Kenya, where he grew up.

Theme: "Achievements, Challenges and Prospects of Research and Innovation Development in Africa"

Panel Discussion: Prospects for Research and innovation Development in Africa: Lessons learnt from African innovators from Kenya and Rwanda

Research and development (R&D) is a major tool for improving industries through novel data and information generated primarily as technological innovations. There are strong policies, interventions, and opportunities to support research, technology,y and innovation development such as The UnitedNations's (UN) Sustainable Development Goals (SDGs) agenda and The African Union's (AU) 10-year Science, Technology and Innovation Strategy for Africa (STISA 2024). The implemented process for R&D and innovation development will be further augmented by the recent adoption of the African Continental Free Trade Area (AfCFTA). However, investment in R&D in Africa is only 1.3% of the global R&D investment. Innovation development is highly associated with increased national technology capacity and industrial growth. The keynote address will focus on ***"Achievements, challenges and Prospects of Research and Innovation Development in Africa"*** thereafter there will be a panel discussion by innovators from some African countries on ***"Prospects for Research and Innovation Development in Africa: Lesions learnt from African innovators from Kenya and Rwanda"***

Food security is a function of a diverse set of drivers in Africa. Key among these is the effects of insects, both harmful and beneficial ones. For example, harmful insects have far-reaching consequences on One-Health in that they can cause tremendous crop losses affecting the livelihood of poor resource farmers and the national economy across the continent. The health of humans and livestock can be enormously affected by insects directly or indirectly as vectors of diseases. On the other hand, insects such as pollinator decomposers and other ecosystem service providers are essential in balancing our ecosystem and contributing to healthy and quality food production, thereby ensuring food security.

Over the years, icipe has developed technologies to manage harmful and harness beneficial insects. Just to highlight a few examples, icipe initiated flagship programmes to combat invasive pests such as Tuta absoluta, fall armyworm, Asian fruit fly, mosquito, and tsetse fly but also insects for food, feed and other uses, beekeeping and hive products.

However, upscaling these technologies to grassroots beneficiaries is not always smooth. Issues related to accessibility and affordability of the required input, poor awareness among the growers and other stakeholders, lack of private sector interest and the lack of harmonization and political will, among many others. Commitment from various stakeholders, especially buy-in by the policy maker in upscaling the developed technologies for harmful and beneficial insects, will undoubtedly yield a brighter perspective in creating new job opportunities, closing the gender gap, protecting our environment, and enhancing access to lucrative export markets of African produce. All this combined will, beyond no doubt, lead to the overall improvement of the livelihood of African populaces.

Agriculture plays an important role in the development of all countries. In Rwanda, it contributes about 29% of the National GDP. However, pest outbreaks of fall armyworm affect tomato leaves. This is both a threat to maize and tomato production. The use of synthetic pesticides leads to risks for humans and environmental contamination. Ms. Joelle Kajuga is a female scientist at Rwanda Agriculture and Animal Resources Board (RAB) funded by NCST through NRIF in Rwanda who is working on a project to improve the livelihoods of citizens through the development of biocontrol products based on local beneficial insect-killing nematodes. Ms. Kajuga and her colleagues are working on entomopathogenic nematodes (EPNs) mass production by using local inputs to develop effective EPNs formulations against the targeted pests. The team is also carrying out laboratory bioassays of EPNS against targeted pests, conducting on-station and on-farm trials. The goal is to integrate the nematode-based biocontrol solutions into the agricultural practices of Rwandan and African farmers. Currently, five (5) local Rwandan EPN strains and species have been characterized and maintained. There is the capacity for improved continuous EPN mass production with enough quantity at the Biocontrol facility. The team has screened over 5 local EPNs against Spodoptera frugiperda & Tuta absoluta in the laboratory and showed that most can kill both pests. Novel gel-based formulations developed show promising results under field conditions, particularly for fall armyworms. Entomopathogenic nematodes appear to be effective and safe biocontrol agents for insect pests such as fall armyworms, tomato leaf miners, and others. Products are under development for use by farmers. The outcome of this innovative project is to decrease the reliance on external insect control products developed elsewhere by promoting home-grown technologies through Rwandan biopesticide research with minimal risk to human health and agroecosystem.

The development of climate-friendly infrastructure specifically transport plays a crucial role in improving greenhouse gases and air pollution in Rwanda and Africa. Air pollution from locomotives and industries contributes negatively to climate change causing significant morbidity and mortality in Africa and globally. A team from Beno Holdings, a non-governmental organization in Rwanda NCST through NRIF is working on a research project to generate data on air quality and GHG data and monitoring by combining ICT-based high tech from Beno Holdings Technology Ltd, Mechanical Engineering skills from green analytics and air pollution research skills from the University of Rwanda. The project is providing evidence-based policy recommendations to reduce traffic emissions and provides a useful dataset that will be useful to public health institutes. The team is developing a novel system that combines sensors, control units, and actuators to detect the gases produced by vehicles and compare it to normal standards. They are using a command actuator for a buzzer sound and stop the vehicle when it exceeds the standards exhaust/pollutants standard limits. It continuously monitors exhaust gases and air pollutants produced by a vehicle. The goal is to provide long-term data for exhaust and air pollution emissions useful for policy recommendations to reduce emissions from transport. The team has developed and tested two prototypes and the team is producing Air Pollution and GHGs Information data from the transport sector (Fixed, Mobile, vehicle pipe, and Modelling air quality). The goal is to promote environmentally sustainable transport-reduce congestion in Kigali and elsewhere (Population exposure, Anti-Idling, Public and active transport, road charges, and Axle Load Control System). The team will continue to promote awareness and capacity building to the public, students, and academic researchers after generating a dashboard (Data bank) from fixed and mobile stations that will generate a model that includes vehicle characteristics (age, model, make, odometer readings), and conditions (drive-cycle), to understand the determinants of GHG and air pollution.

At the end of the pannel discussion the audience will have answers to the following questions:

1. Briefly describe the status of research and innovation development in Africa?
2. Despite several policies in place, what has been the challenges for improving R&D and innovation development in Africa?
3. Based the information on innovations you have supported/implemented as achievements, **what can be done in Africa differently to advance research and innovation?**
4. Briefly describe how your innovations (in Africa) provide hope for future commercialization's of new (novel products and services)? Any personal examples as stories, experiences etc?
5. What can African leaders and funding organizations do differently to leapfrog the gap of low R&D and Innovation landscape (i.e. invest more in R&D, human resources development, greater tech infrastructure, to lead to increased innovation, productivity, boost your business, have competitive advantage?)
6. What is your final advocacy and Call for Action to advocate for improved research and innovation development in Africa.

PANEL DISCUSSION SESSIONS

Theme: "Prospects for Research and innovation Development in Africa, and lessons learnt from Grand Challenges National Programs from Ethiopia, South Africa, and Rwanda"

Prof. Eliane Ubalijoro,
CEO of CIFOR-ICRAF and Director General of World Agroforestry – ICRAF,
Panel Member

Dr. Esperance Munganyinka,
Head of National Research Innovation Fund Department, NCST
Panel Member

Dr. Moses Alobo,
Program Manager Grand Challenges Africa
Moderator

Dr. Shallo Daba Hamuse,
Grand Challenges Ethiopia,
National Health Innovation Program coordinator
Panel Member

Ms. Zoleka Ngcete,
Program Manager at South African Medical Research Council
Panel Member

Dr. Moses Alobo,

Program Manager Grand Challenges Africa

Dr. Moses Alobo is a physician, public health expert and social impact entrepreneur with over 20 years of experience. He leads the Science Innovation Translation and Entrepreneurship team at the Science for Africa Foundation, a science funding and programme development organization based in Africa. Moses supports scientists in designing and conducting locally relevant research proposals, their associated technology transfer, capacity strengthening and policy engagement for the development of critical areas of science in Africa. Moses has experience in implementing health and research programmes in >30 countries in Africa in various fields of science and medicine. For example, he recently led the MNH research priority-setting exercise for African researchers in 2019-20 and co-Chaired the work for the Covid-19 research priorities for Africa. He has had various other appointments as Clinical Research Director at GSK – Africa NCD Open lab, Sub-Sahara Medical Affairs manager at Hoffman La Roche, Clinical Trial Manager at Drugs for Neglected Diseases Initiative and several board appointments, including at Kenya Medical Research Institute.

Moses studied medicine at the University of Nairobi (Kenya) and later Public Health at the University of Birmingham (UK). He has been awarded the LSHTM Executive Global Health Leadership fellowship 2019, The Archbishop Desmond Tutu African Leadership fellowship in 2014, the EU Contact Point Network for Young African Scientists Fellowship in 2007 and the British Chevening Scholarship in 2005.

His current research interests include research prioritization and health technology assessment techniques.

Dr. Esperance Munganyinka,

Head of National Research Innovation Fund Department, NCST

Dr. Esperance Munganyinka is a head of the Department of National Research and Innovation Fund (NRIF) at National Council for Science and Technology (NCST)-Rwanda. Before joining NCST in 2020, she has served as a research scientist over 12 years in Rwanda Agriculture and Animal Resources Development Board conducting research, training, and outreach studies in the areas of Biological and Agricultural sciences. Her research has led to the publication of ten (10) refereed journal papers. She won various competitive research grants and coordinated several research projects through which she was given the opportunity to develop valuable project management skills, leadership skills and mentoring skills. Dr. Esperance is motivated to provide her contribution in management and coordination of NRIF to ensure achievement of goals of improved national research performance and productivity towards socio-economic transformation.

Prof. Eliane Ubalijoro

CEO of CIFOR-ICRAF and Director General of World Agroforestry – ICRAF

Prof. Eliane Ubalijoro, PhD is the CEO of CIFOR-ICRAF and Director General of World Agroforestry – ICRAF. She is a member of the Capitals Coalition Supervisory Board as of May 2023. Eliane is a Professor of Practice For Public-Private Sector Partnerships at McGill University's Institute for the Study of International Development since 2008. Eliane is a member of Rwanda's National Science and Technology Council and Presidential Advisory Council. She is a member of the Impact Advisory Board of the Global Alliance for a Sustainable Planet. From 2021 to March 2023, Eliane was the Executive Director of Sustainability in the Digital Age and the Canada Hub Director for Future Earth. She is a co-editor of the 2021 book Building Resilient African Food Systems after COVID-19. Eliane is a member of the External Advisory Committee to the Chief Statistician of Canada and Environment and Climate Change Canada on Canada's first Census of Environment.

Eliane was a member of the Expert Consultation Group on the Post-COVID-19 Implications on Collaborative Governance of Genomics Research, Innovation, and Genetic Diversity. She was the Deputy Executive Director for Programs at Global Open Data in Agriculture and Nutrition (GODAN) from 2019 to 2021. She has facilitated the UNAIDS Leadership Programme for Women at the United Nations System Staff College. Eliane's career path was featured in Forbes in celebration of International Women's Day 2019. She is the recipient of the 2022 Award from the International Leadership Association Women and Leadership Member Community for Outstanding Practice with Broad Impact.

Eliane is a fellow of the International Science Council and on the board of the Science for Africa Foundation. She was the project manager and an investigator on phase I and II Gates Foundation Grand Challenges in Global Health project led by Professor Timothy Geary, the director of McGill's Institute of Parasitology from 2009 to 2014. She was the principal investigator on a Gates Grand Challenges Phase I grant looking at Innovations in Feedback & Accountability Systems for Agricultural Development from 2014 to 2015.

Ms. Zoleka Ngcete

Program Manager at South African Medical Research Council

Ms. Zoleka Ngcete is a Senior Programme Manager at the Grants, Innovation and Product Development Division of the South African Medical Research Council (SAMRC), where she manages the Strategic Health Innovation Partnerships and Grand Challenges South Africa programs. The programmes are focused on supporting the discovery and development of health innovations aimed at improving health outcomes and/or social benefits for South Africa and other low-resource settings.

Zoleka has 15 years experience in research and innovation program management. Previous roles include managing the South African Malaria Initiative at the University of Pretoria and at BioPAD and working as a Business Development Manager and Regional Head at the Technology Innovation Agency (TIA).

She holds a MSc in Biotechnology from Rhodes University, and diplomas in project and business management. She also completed the Executive Programme for Global Health Leadership at the London School of Hygiene and Tropical Medicine.

Dr. Shallo Daba Hamuse

Grand Challenges Ethiopia,
National Health Innovation Program Coordinator

Dr. Shallo graduated from Jimma University Ethiopia in a Bachelor of Science in Public in 2000, MPH from Royal Tropical Institute (KIT), Netherlands, in 2006, and earned a Doctor of PhilosophPh.D.PhD) from the University of Bergen in 2017. He has published over 50 peer-reviewed articles on TB, HIV, and maternal and child health

Dr Shallo is a public health professional and Epidemiologist with more than 25 years of progressive experience leading strategic technology initiatives and serving in senior management positions in the government health sector and closely working in collaboration with international nongovernmental organizations and UN agencies. Currently, he is working for the Ministry of Health at the position of Senior Grand Challenges Ethiopia national Health Innovation program coordinator at Armauer Hansen Research Institute (AHRI).

He began his professional career as a health service provider at the health center, and hospital, and also worked at different senior management positions including CEO for a regional referral hospital, Oromia regional HIV/AIDS office head, health bureau deputy head, and health Bureau head, Director General for the federal HIV/AIDS prevention and control office.

Over the course of his career, Dr. Shallo has substantially contributed to strengthening the health systems and improving maternal, child, TB, and HIV control programs' performance. In 2016 he got an award from WHO county offices for his best research work on TB and in 2020 from the federal Ministry of health for his best health service leadership and contribution to transform the health sector in Ethiopia. He joins AHRI in 2019 as Grand Challenges Ethiopia National Health Innovation program coordinator. Since then he has substantially contributed in creating the national health innovation ecosystem through the GCE program.

Theme: "Prospects for Research and Innovation development in Africa: Lessons learnt from developed countries"

Mr. Yves Iradukunda,
Permanent Secretary,
Ministry of ICT and Innovation
Panel Member

Dr Aliza Belman Inbal,
Founding Director of the Pears Program for Global Innovation
Panel Member

Ms Noella Bigirimana,
Deputy Director General at the Rwanda Biomedical Centre, RBC
Moderator

Prof. Alfred Bizoza,
Professor, UR
Panel Member

Dr. Solange Uwituze,
The Deputy Director-General, RAB
Panel Member

Ms Noella Bigirimana,

Deputy Director General at the Rwanda Biomedical Centre, RBC

Noella Bigirimana is the Deputy Director General at RBC, a national health implementation agency in Rwanda. Noella previously served as Division Manager of Research, Innovation and Data Science at RBC. She has also served as Precision Medicine Fellow at the World Economic Forum, where she focused on co-designing policy and governance approaches to accelerate the adoption of emerging technologies in low-resource settings.

Noella has also worked as consultant for WHO and USAID-funded projects in Rwanda and Guinea-Conakry in the post-Ebola period. Noella currently serves on the Advisory Board of AI Transparency Institute, and also serves as the Advisory Board Chair of the Youth Combating NTDs. She is a World Economic Forum's Global Shaper in the Kigali Hub, and a contributor at the Future Africa Forum. She holds a Bachelor's degree in Human Biology, Health and Society from Cornell University, and a Master's degree in International Health Policy and Management from the Heller School at Brandeis University.

Mr. Yves Iradukunda,

Permanent Secretary,

Ministry of ICT and Innovation

Iradukunda joined the public service from the Allan&Gill Gray Philanthropy where he served as the Rwanda Country Director. Prior to AGGP, he was a Senior Director at MASS Design Group, a global design firm with offices in the U.S. and Kigali. Iradukunda's role at MASS included oversight of operations across global offices and the coordination of design and construction projects. Iradukunda has a passion for entrepreneurial innovation.

He launched his career working with Bridge2Rwanda as a professional career advisor with a focus on talent development and placement, coaching and counseling scholars with regards to their personal growth and careers. At the same time, he helped launch and manage a startup and other youth initiatives. Iradukunda is an alumn of the African Leadership University School of Business where he earned an MBA degree. He holds a BS in Mathematics and Computer Science from Oklahoma Christian University.

Dr. Aliza Belman Inbal,

Founding Director of the Pears Program for Global Innovation

Dr. Aliza Inbal is the Founding Director of the Pears Program for Global Innovation. The Pears Program builds bridges between the Israeli innovation ecosystem and the developing world, in order to increase the relevance and impact of Israel's contribution to technological innovation for development. The Pears Program collaborates with innovation ecosystem actors throughout Africa, as well as with the Israeli government, private and entrepreneurial sectors to develop relevant policies and programs to support technology innovation in all SDG fields.

Dr. Inbal is one of Israel's top experts in innovation ecosystems for inclusive innovation. She has been responsible for the design and launch of several innovative Israeli government programs to support Israeli technology innovation for development, including Grand Challenges Israel, the India-Israel Global Innovation Bridge and the Israel Innovation Authority's Adaptation Fund for proven technologies entering emerging markets. In addition to her work in the Pears Program, she has also worked as a consultant for the World Bank and other international organizations on science, technology and innovation policy. For her impact on Israel's approach to inclusive technology innovation, she was chosen in 2012 by an Israeli national newspaper as one of the 100 most influential. Prior to this, she was a Senior Evaluation Officer at the World Bank, where she led large evaluation studies.

Dr. Solange Uwituze,

The Deputy Director-General in Charge of Animal Resources Research and Technology Transfer at Rwanda Agriculture and Animal Resources Development Board (RAB)

Dr Solange Uwituze has 16 years of Experience in Higher Agriculture Education and 5 years in Agriculture for Development (AR4D). She is currently the Deputy Director General in charge of Animal Resources Development at Rwanda Agriculture and Animal Resources Development Board _RAB. Further, Uwituze is currently serving as a Board member of Rwanda Development Board-RDB. She is also the Board Chair of Gabiro AgriHub Business Ltd and a Deputy Board Chair of Gako Meat Company Ltd. and a former Board member of the Kigali Collaborative Research Center-KCRC. Dr Uwituze is also a founding fellow of the Rwanda Academy of Sciences – RAS and serves as member of the Consultative Advisory Group (CAG) of the Partnership for skills in Applied Sciences, Engineering and Technology – PASET;

Prior to the current position, she served as the Program Manager for Partnerships and Business Management at the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) Secretariat and the Program Manager for Training and Quality Assurance at the same institution. RUFORUM is a Consortium of 163 African universities operating within 40 African countries. Prior to joining the RUFORUM Secretariat, she served as Dean of Faculty of Agriculture, former National University of Rwanda where she was instrumental in setting up Agriculture MSc and PhD programs under Swedish Development Agency – Sida partnership. She has led teams that successfully won a number of Capacity development projects such as the World Bank funded Africa Centers of Excellence, CIUF/CUD, EDULINK, etc; both at the faculty level and RUFORUM Secretariat. She has experience in leadership and management of various Capacity Building projects including those funded by USAID, NUFFIC, Sida, DAAD, EU, and Carnegie Corporation of New York.

Theme : "Prioritizing Research in Vaccine Pharmaceutical Products and Services in Africa"

Dr. Louis Kayitalire, M.D.
Chief Medical Officer, F-star Therapeutics, Cambridge-UK and Cambridge-US
Panel Member

Prof. Emile Bienvenu
Director General, FDA
Panel Member

Mr. Andrew Kareba
RBA Journalist
Moderator

Dr. Nyombayire Julien
Research Physician and Investigator at Rwanda Zambia Health Research Group - Projet San Francisco/Center for Family Health Research
Panel Member

Dr. Paul McDonald
Vice President, Modular Manufacturing Development, BionTech
Panel Member

Mr. Andrew Kareba,

RBA Journalist

Andrew KAREBA is a Rwanda Journalist with 12 years of experience as a TV content creator, MC, Moderator and producer. He is a TV Executive Producer at Rwanda Broadcasting Agency (RBA). He is a Director of TV programs, producer of documentaries. He is mainly known as Producer and host of a youth program "Inspire Me", an entrepreneurial outlook among youth by challenging them to tackle the root causes of problems in their communities with innovative mind-set in order to create sustainable solutions that will benefit them at the same time train other inspired youth to follow the entrepreneurship path.

Dr. Nyombayire Julien,

Research Physician and Investigator at Rwanda Zambia Health Research Group - Projet San Francisco/ Center for Family Health Research

Dr. Nyombayire is a research physician currently serving as the Head of Medical Department at the Center for Family Health Research in Rwanda. As a clinician with over 10 years' experience in clinical research, he has served as investigator in several observational cohort's studies as well as multicenter clinical trials of preventative vaccine and therapeutics in different infectious diseases area including HIV, Ebola, Covid-19 and Malaria.

He is currently serving as the Principal Investigator for the first ever Phase 1 clinical trial of an mRNA HIV vaccine candidate conducted in Africa and a co-investigator of the first large Phase 3 Ebola vaccine trial among pregnant women. In addition, Dr Nyombayire has extensive experience in the management of large infection diseases prevention programs (e.g. HIV, Ebola) involving most at risk populations and in collaboration with large external funding agencies. As part of his daily clinical work, Dr Nyombayire is involved in the care and treatment of patients living with HIV and patients with symptoms of sexually transmitted infections (STIs) and contributes to the development of HIV and STIs clinical guidelines.

Dr Nyombayire holds a degree of General Medicine and Surgery from the National University of Rwanda and a Master's of Sciences degree in Clinical Trials from the London School of Hygiene and Tropical Medicine as well as several professional certifications in the management of clinical trials.

Prof. Emile Bienvenu,

Director General, FDA

Prof. Emile holds a B. Pharm, a Master's degree (Pharmacology) from University of the Western Cape in South Africa, and a PhD (Medical Science) from the University of Gothenburg in Sweden in the area of Clinical Pharmacology.

Prof. Emile BIENVENU has been the Director General of Rwanda FDA since August 2021. Associate Professor of Pharmacology, he previously worked at University of Rwanda (1998 – 2021), where he served as Acting Deputy Vice Chancellor for Academic Affairs and Research (2020-2021), University Director for Innovation (2017-2020), and Executive Secretary for the University Research Office for six years (2002 to 2008). He also served as External Examiner at Muhimbili University of Health & Allied Sciences in Tanzania until 2016. From July 2011 until May 2013 he was the Head of Medical Procurement Division at Rwanda Biomedical Center. Dr. Emile served as the Chairman of the Board of Directors of Rwanda Standards Board (RSB) for 11 years (2009 – 2020) and served as a Member of the Board of Directors at Rwanda Military Hospital (2012-2018).

Prof. Emile is an expert in hospital Drug & Therapeutic Committees (DTCs). He provided technical assistance as a resource person to the Ministry of Health in Rwanda (2006) in formulating the first editions of the Standard Treatment Guidelines and Drug Formulary. His research focuses on therapy optimization based on pharmacokinetic and pharmacogenetic considerations. He is the Country Principal Investigator of various research and innovation projects, and has authored a number of papers in peer-reviewed international Journals .

Dr. Paul McDonald

Vice President, Modular Manufacturing Development, BionTech

Paul McDonald is Vice President of Modular Manufacturing Development at BioNTech. He joined BioNTech in 2021 with the responsibility for developing technical solutions for modular manufacturing including the BioNTainer. He leads the group responsible for the global deployment of BioNTainers to regional manufacturing sites including the BioNTainer manufacturing site in Kigali, Rwanda. Prior to joining BioNTech, Paul worked in the biopharmaceutical industry for 20 years developing and implementing manufacturing process for therapeutic candidates in clinical development including protein therapeutics and mRNA-based vaccines.

Theme : "Prospects for Research and innovation Development in Africa: Lessons learnt from African innovators from Kenya and Rwanda"

Ms. Kajuga Nsamira Joelle,
Research scientist in crop protection at RAB
Panel Member

Dr. Niassy Saliou,
Senior Scientist the Technology Transfer Unit
Panel Member

Ms. Esther Kunda,
Director General, Innovation & Emerging Technologies
Moderator

Dr. Vincent Okungu,
Career Health Economist and a researcher at University of Nairobi
Panel Member

Mr. Rukundo Jean Pierre,
Founder and CEO, Beno Holdings
Panel Member

Ms. Esther Kunda

Director General, Innovation & Emerging Technologies

Ms. Esther Kunda is the Director General in charge of Innovation and Emerging Technologies at the ministry of ict and innovation where she drives policy initiatives and interventions to support the Rwandan innovation ecosystem and development of new emerging technologies in the country.

Before joining the Ministry of ICT and Innovation, Esther Kunda was the Policy, Innovation and Community of Scientists Manager at the Next Einstein Forum. She managed the development of NEF policy initiatives and worked closely with the NEF Community of Scientists on science engagement activities such as the NEF Africa Science Week across Africa.

Before joining NEF, she was at Intel as Education Support Manager and as product development for Tigo Rwanda. She has experience in product development, business strategy, policy and innovation.
She holds a Masters in Science in Information Technology from Carnegie Mellon University and Bachelor of Science in Computer Engineering from Kigali Institute of Science and Technology.

Ms. Kajuga Nsamira Joelle

Research scientist in crop protection at Rwanda Agriculture and Animal Resources Development Board (RAB), NCST Awardee

Kajuga Nsamira Joelle is employed as a research scientist in crop protection at Rwanda Agriculture and Animal Resources Development Board (RAB). She is a well-trained crop protectionist with a Masters degree in Crop Protection at the "Faculté Universitaire des Sciences Agronomiques de Gembloux Agro Biotech" in Belgium. She obtained her BSc degree at the National University of Rwanda, Faculty of Agriculture, Crop Production and horticulture. She worked at the Agriculture research institute for almost 13 years. Her research focuses on pest diagnosis, crop pest management, and cultural, biological, and chemical control of plant pests and diseases by exploring them in integrated pest management (IPM). She is experienced in conducting field and laboratory experiments, in-vitro culture for producing free disease plantlets, field surveillance, and containing pest outbreaks. Joelle also contributes to technology transfer by developing extension materials, providing training to extension agents and other scientists, and disseminating information to farmers through different pathways. In 2010, she was awarded a 2 years post-master's fellowship program by the laureate of African Women for Agricultural Science and Technology (AWARD) where she was trained on Leadership Management and mentorship. For 4 years, Joelle successfully coordinated all research activities conducted at RAB Southern zone division. For 2 years, she was the national project coordinator for the Department for International Development (DFID) AgriTT research challenge fund project (AgriTT-RCF-Project 1301) that successfully introduced the biological control using entomopathogenic nematode (EPNs) to Rwanda leading to the establishment of a mass production laboratory.

For now, 20 months, Mrs. Joelle is leading a project funded by NCST on the use of biocontrol, the EPNs, in the management of fall armyworms and tuta absoluta, tomato leaf miner, attacking respectively maize and tomato plants. Mrs. Kajuga Nsamira Joelle has contributed to the publication of more than 10 papers in the domain of plant protection, entomology, plant pathology, and biocontrol. She also contributed to setting up strategies in different national task forces, as a focal person representing RAB in other institutes' projects.

Dr. Niassy Saliou,

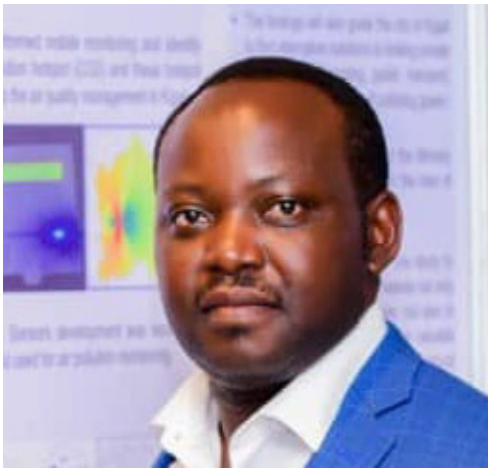
Senior Scientist, the Technology Transfer Unit

Dr. Niassy Saliou is a Senior Scientist in the Technology Transfer Unit and is based at Duduville. He holds a PhD in Zoology (Entomology) from Jomo Kenyatta University of Agriculture and Technology (JKUAT) under the ARPPIS-DAAD Programme. He also has a MSc, BSc in Natural Sciences and a Postgraduate Degree in Zoology from the Cheikh Anta Diop University of Dakar.

Before this position, he worked as a scientist in the same unit between 2014 and 2015 and 2017 and 2022. He was the first Coordinator of AfroMont and the Land Matrix Initiative at the University of Pretoria in South Africa, respectively, between 2011 and 2013 and 2015 and 2017. He has also worked as a Postdoctoral Fellow on Thrips Bioecology at icipe under the AU-funded Grain Legume project between 2013-2015.

Saliou is a member of the African Association of Insect Scientists (AAIS), of which he served as Secretary between 2013-2017 and then as President between 2017-2022. He is the Editor in Chief of the International Journal of Tropical Insect Science (IF: 1.0). Some of his professional achievements are Biopesticide Development, Discovery of thrips aggregation behaviour and aggregation pheromones, Continent-wide inventory of edible insects, Expansion of Push-Pull technology in Sub-Saharan Africa and Fall armyworm research.

Between 2018 and 2020, Saliou introduced icipe Push-Pull technology in Rwanda.



Mr. Rukundo Jean Pierre

Founder and CEO, Beno Holdings

Rukundo is an IT Specialist and Researcher, with unconventional skills in artificial intelligence and computer modeling applications for environmental engineers. He has been fascinated by the computer world since he was a child.

It is in this perspective that in 2015, after having noticed that the number of car crashes and deaths from vehicle accidents, is huge that made him wonder what he could do to solve this problem. He decided to do training on speed management in Kenya for 3 months and once back, with his skills in IT, he founded Beno Car Technology Ltd. It immediately became the pioneer of cruise control in Rwanda, and currently, it is the largest provider of cruise control and vehicle tracking services. It works with various public transport in the country.
After a success of Beno Car technology ltd, he set out to find solutions to other challenges, and that s how he founded Beno Holdings Ltd, a leading solution provider dedicated to solving difficulties faced by Rwandans in general by delivering products and services that user/eco-friendly by ensuring optimum utilization of resources while ensuring a zero-waste model.

ORGANIZING COMMITTEE

A welcome message from the Organizing Committee chair

Dr. Louis Sibomana,
Chair, Organizing Committee, GC Rwanda.

Head of Science, Technology Development and Outreach Department, National Council for Science and Technology, Rwanda

A warm welcome to the Launch of Grand Challenges Rwanda, which is taking place in Kigali on 18-19 May 2023 at the Kigali Convention Center (KCC). The overall theme of the launch event is "Supporting research and development (R&D) through cooperation to promote excellence and scale of evidence-based innovations".

The launch of Grand Challenges Rwanda has been organized by the Rwanda National Council for Science and Technology (NCST) in collaboration with its national stakeholders and Grand Challenges Africa through the Science for Africa Foundation (SFA) and the African Union Development Agency - New Partnership for Africa's Development (AUDA-NEPAD).

The launch of Grand Challenges Rwanda gathers invited national, regional, and global participants including globally renowned key speakers, policymakers, development partners, academia, researchers, and industry. We consider this a good platform and opportunity to network, share ideas and establish further partnerships and collaboration among the participants.

During the launch of Grand Challenges Rwanda, a series of activities are planned including:

- Official launch of the Grand Challenges Rwanda
- Delivering keynote speeches
- Panel sessions
- Signing an MoU between NCST and SFA
- Publish a Request for proposal (RFP)
- Exhibition

The Organizing Committee wishes all participants a fruitful launch and good time

Organizing Committee Members

Dr. Louis Sibomana,
NCST
Chair of the Committee

Mr. Simon Ndoria,
SFA
Member of the Committee

Dr. HABAKUBAHO Gédéon,
INES Ruhengeri
Member of the Committee

Ms. Maria Stella Namyalo, MBA,
AUDA-NEPAD
Member of the Committee

Prof. Alfred Bizoza,
UR
Member of the Committee

Dr. Jean Claude Ngabonziza,
RBC
Member of the Committee

Ms. Emilie Uwase,
FONERWA
Member of the Committee

Mr. Florent Uwacu,
PSF
Member of the Committee

Dr. Fabien HABIMANA,
MINEDUC
Member of the Committee

Dr. Marie Chantal Cyulinyana,
NCST
Member of the Committee

Mr. Philippe Kwitonda,
MoE
Member of the Committee

Mr. Jean Louis NIRAGIRE,
NCST
Member of the Committee

UMUTONI Rurangirwa Nina,
NCST
Member of the Committee

Mr. KAYUMBA Theogene,
NCST
Member of the Committee

Mr. Katabarwa Robert,
MINICT
Member of the Committee

Dr. Didacienne Mukanyiligira,
NCST
Member of the Committee

Mr. SANO Anselme,
NCST
Member of the Committee

Exhibitions

S/N	Institution	Logos
1.	National Council for Science and Technology (NCST)	
2.	University of Rwanda African Centre of Excellence in Internet of Things (UR-ACEIoT)	
3.	University of Rwanda African Centre of Excellence in Data Science (UR-ACEDS)	
4.	Rwanda Biomedical Centre (RBC)	
5.	International Centre of Insect Physiology and Ecology (icipe)	
6.	Inter-University Council for East Africa (IUCEA)	

Program

Kigali Convention Center (KCC), Kigali
18th – 19th May 2023

DAY ONE: Thursday 18TH May 2023

THURSDAY, MAY 18TH, 2023

SESSION 1: 08:00 a.m - 11:00 a.m
Defining the theme & Meeting Goals, Keynote Addresses and Panel sessions

Time	Activity	Responsible
8:00 – 9: 00 a.m	Arrival and registration	Protocol
9:00 – 9:05 a.m	Remarks by Master of Ceremony	**MC: Ms. Esther Kunda,** Director General, Innovation & Emerging Technologies, MINICT
9:05 – 9:15 a.m	Defining Theme & Meeting Goals	**Dr. Eugene Mutimura,** Executive Secretary (NCST)
9:15 – 9:40 a.m	**Keynote Address** **Theme:** "Global Grand Challenges Achievements and Prospects"	**Ms. Kedest Tesfagiorgis,** Deputy Director, Global Partnerships and Grand Challenges, Bill & Melinda Gates Foundation
9:40 –10:40 a.m	**Panel Discussion** **Theme:** "Prospects for Research and innovation Development in Africa, and lessons learnt from Grand Challenges National Programs from Ethiopia, South Africa, and Rwanda"	**Moderator:** Dr. Moses Alobo **Panelists:** • Prof. Eliane Ubalijoro • Ms. Zoleka Ngcete • Dr. Esperance Munganyinka • Dr. Shallo Daba
10:40 –11:00 a.m	Health Break, Networking and Exhibition	Protocol
SESSION 2: 11:00 a.m - 14:30 p.m ***Remarks, Signing of MoU and Press Conference***		
11:00 –11:15 a.m	Remarks by CEO, Science for Africa Foundation	**Prof. Thomas Kariuki,** Chief Executive Officer (CEO), Science for Africa Foundation

	Time	Activity	Responsible
THURSDAY, MAY 18TH, 2023	11:15 –11:30 a.m	Remarks by **AUDA-NEPAD Delegate**	**Prof. Aggrey Ambali,** Senior Advisor at the African Union Development Agency (AUDA-NEPAD)
	11:30 –11:50 a.m	Remarks by Minister of Education of the Republic of Malawi	**Hon. Madalitso Kambauwa Wirima,** Minister of Education of the Republic of Malawi
	11:50 –12:00 p.m	Signing MoU and Publishing Request for proposal (RFP), by NCST and SFA	Protocol
	12:00 –12:20 p.m	Official Launch & Guest of Honour remarks	**Hon. Dr. Valentine Uwamariya,** Minister of Education, the Republic of Rwanda and Co-Chair of NCST Council
	12:20 –12:30 p.m	Group Photo	Protocol
	12:30 – 2:30 p.m	Lunch, Networking, Exhibition	Protocol
	1:00 – 2:00 p.m	Press Conference Invited participants	Protocol/ Media Houses
	SESSION 3: 14:30 a.m - 19:30 p.m Keynote Address, Panel discussion, Networking, Exhibition and Gala Dinner		
	2:30 – 3:00 p.m	**Keynote Address Theme:** Role of Research and Development (R&D) and Innovation in Economic Growth and Prosperity of Nations	**Prof. Alfred Bizoza,** Professor at University of Rwanda
	3:00 – 4:00 p.m	**Panel Discussion Theme:** Prospects for Research and Innovation development in Africa: Lessons learnt from other countries	**Moderator**: Ms. Noella Bigirimana **Panelists:** • Mr. Yves Iradukunda • Prof. Alfred Bizoza • Dr. Aliza Belman Inbal • Dr. Solange Uwituze
	4:00 – 5:30p.m	**Health Break, Networking and Exhibition**	**Protocol**
	5:30 – 7:30 p.m	**Gala Dinner**	**Protocol/ KCC team**

DAY TWO: Friday 19th May 2023			
FRIDAY, MAY 19TH, 2023	**SESSION 4: 08:00 a.m - 09:00 a.m** **Day 2: Keynote addresses, Panel discussions, Networking and Exhibition**		
	Time	**Activity**	**Responsible**
	8:00 – 9: 00 a.m	Arrival and registration	Protocol
	9:00 – 9:05 a.m	Remarks by Master of Ceremony	**MC: Mr. Andrew Kareba** Host, Inspire me program at Rwanda TV
	09:05–9:45 a.m	**Keynote Address** **Theme:** "Prioritizing research in vaccine pharmaceutical products and services in Africa"	**Dr. Louis Kayitalire,** Chief Medical Officer, F-star Therapeutics
	09:45–10:45 a.m	**Panel Discussion** **Theme:** "Prioritizing research in vaccine pharmaceutical products and services in Africa"	**Moderator:** Mr. Andrew Kareba **Panelists:** • Dr. Louis Kayitalire • Dr. Julien Nyombayire • Dr. Emile Bievenu • Dr. Paul McDonald
	10:45-11:30 a.m	*Health Break, Networking and Exhibition*	*Protocol*
	SESSION 5: 11:30 a.m - 14:30 p.m ***Keynote address, Panel discussion, exhibition, networking and Leadership Meeting***		
	11:30 –12:00 p.m	**Keynote Address** **Theme:** "Achievements, challenges and Prospects of Research and innovation Development in Africa"	**Dr. Vincent Okungu,** Health Economist and Researcher, University of Nairobi
	12:00 - 1:00 p.m	**Panel Discussion** **Theme:** "Prospects for Research and innovation Development in Africa: Lessons learnt from African innovators from Kenya and Rwanda"	**Moderator:** Ms. Esther Kunda **Panelists:** • Dr. Vincent Okungu • Ms. Kajuga Joelle Nsamira • Mr. Rukundo Jean Pierre • Dr. Saliou Niassy

	Time	Activity	Responsible
	1:00 - 2:30 p.m	Lunch and Exhibition	Protocol
	2:30 - 4:00 p.m	Leadership meeting **Invited guests**	**Protocol**
	4:00 - 5h00 p.m	**Networking and Exhibition**	**MC**
	5: 00 p.m ---	**Adjourn and Departure**	**All**