A Career Dedicated to Soil ecology and Environmental Remediation: Mr. Alexis KAYIRANGA's remarkable Journey

Mr. Alexis Kayiranga is a distinguished environmental scientist with a profound commitment to advancing ecological sustainability and resilience. Born in Rwanda in 1989, his career has been driven by a deep passion for preserving natural ecosystems and promoting sustainable development through innovative research, transformative teaching, and meaningful community engagement.

With a strong focus on urban and agricultural soil ecology, soil and water remediation, biochar applications, and the role of soil fauna in soil health, **Mr. Kayiranga** has made substantial contributions to understanding soil dynamics and their impact on ecosystem sustainability. His research explores novel approaches to enhancing soil fertility, mitigating environmental contamination, and improving land-use practices to support both food security and climate resilience. Through groundbreaking studies and interdisciplinary collaborations, he has established himself as a leading voice in environmental science, particularly in addressing the challenges of urbanization, soil degradation, and sustainable land management.

His expertise in soil restoration techniques and biochar utilization has contributed to innovative solutions for improving soil quality, carbon sequestration, and water conservation. **Mr. Kayiranga**'s work not only advances scientific knowledge but also fosters practical applications that benefit communities and policymakers striving for environmental sustainability.

Academic Foundation: Building Expertise across Multiple Disciplines

Mr. Alexis Kayiranga's academic journey began in Rwanda, where he earned a B.Sc. in **Soil and Water Management** from the University of Agriculture, Animal Science and Veterinary Medicine in 2015. His bachelor research, titled "***The Effect of Land Use Systems on Soil Properties; A Case Study from Rwanda***" investigated the effects different land use practices on soil fertility, erosion, or nutrient cycling. Under the supervision of **Dr. Jeannine Uwanyirigira**, his research has been published in the peer-reviewed journal ***Sustainable Agriculture Research***.

From 2018 to 2021, his academic curiosity led him to further studies in **Urban and agriculture soil ecology, Soil and water remediation, Biochar, Soil fauna in soil health and ecosystem resilience** at the **University of Chinese Academy of Science (UCAS) and Institute of Urban environment (IUE), Chinese Academy of Sciences (CAS), Xiamen, China**, where he completed a **Master of Science in Environmental Science**. His master's research, titles "***Thallium Remediation by Biochar Applied into Soil and their Potential Mechanism***" which investigated the effects of biochar on the adsorption of selected heavy metals. His research, conducted under the supervision of **Prof. Luo Zhuanxi**, has been published in renowned peer-reviewed journals, including ***Biochar*** and ***Desalination and Water Treatment***, contributing groundbreaking insights into sustainable soil remediation techniques.

Mr. Alexis Kayiranga, together with his labmates from Prof. Luo Zhuanxi's laboratory at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS), during sampling activities in urban wetlands and agricultural orchards across China.

Mr. Alexis Kayiranga conducting laboratory experiments in the soil laboratories of the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

Mr. Alexis Kayiranga with his master's supervisor, Prof. Luo Zhuanxi, along with the panelists during his master's defense at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

Mr. Alexis Kayiranga has earned a Master of Science degree in Environmental Science from the University of Chinese Academy of Sciences (UCAS), in partnership with the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

From 2021 to 2025, **Mr. Alexis Kayiranga** pursued a **Ph.D. in Environmental Sciences** at the **University of Chinese Academy of Science (UCAS),** in partnership with **the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS)**. His doctoral research, titled "***Urban Extreme Climatic Events-Induced Changes in Soil Fauna Communities and Soil Nutrient Cycling***," examined how urban flooding disrupts soil fauna communities in urban greenspaces, leading to shifts in body size distribution, particularly in exotic plant communities. His research, conducted under the supervision of **Prof. Sun Xin**, has been published in high-impact peer-reviewed journals, including ***Ecology and Evolution***, ***International Journal of Environmental Research and Public Health***, ***Geoderma***, ***Remote Sensing***, and ***Heliyon***, providing valuable insights into urban ecosystem resilience, soil biodiversity conservation, and climate adaptation strategies.

Mr. Alexis Kayiranga together with his labmates during sampling for his doctoral thesis at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

Mr. Alexis Kayiranga conducting sampling activities across four cities in Rwanda, 2024.

Mr. Alexis Kayiranga together with his labmates during experimental work for his doctoral thesis at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

Mr. **Alexis Kayiranga's** research has made substantial contributions to the understanding of how extreme climatic events impact soil ecological processes, particularly the interactions between soil fauna, nutrient cycling, and plant communities in urban environments. His findings enhance knowledge on soil ecosystem resilience, informing strategies for sustainable urban planning, soil restoration, and biodiversity conservation in the face of climate change.

Teaching Skill: Empowering Communities Through Trainings

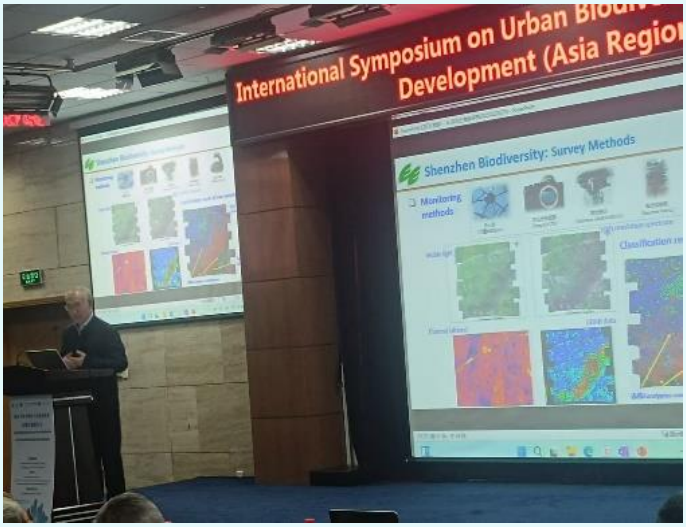
Mr. Alexis Kayiranga acquired teaching skills by training students in the summer school organized by the Xiamen Institute of Urban Environment (IUE), Chinese Academy of Sciences. He shares insights from his research to help undergraduate students understand ecosystem resilience and the importance of sustainable soil management in urban areas.

Mr. Alexis Kayiranga inspiring young minds, undergraduate students, through teaching soil ecology and conducting related experiments during their summer school program at the Institute of Urban Environment (IUE), Chinese Academy of Sciences (CAS).

Mr. Alexis Kayiranga actively participates in community mobilization for environmental protection in China and Rwanda, government activities aimed at collecting information and formulating policies, and international conferences, sharing his findings in soil biology, particularly the distribution patterns of invasive species. He explains how these microorganisms emerge from distinct assembly processes across sub-communities, shedding light on their formation and interactions.

Mr. Alexis Kayiranga reporting his research results on soil organisms, especially the distribution patterns of invasive species, at the Institute of Urban Environment (IUE) of the Chinese Academy of Sciences (CAS).

For example, he takes part in the **International Symposium on Urban Biodiversity and Sustainable Development (Asia region)**, discussing the impact of urbanization on soil animal communities and ecological functions. He also plays a part in the **Sino-Russia International Symposium on Urban Biodiversity and Ecological Functions**, discussing soil animal communities and their role in urban ecosystem resilience.



Mr. Alexis Kayiranga actively participates in global discussions on soil biodiversity and sustainable urban development.

Driving Change Beyond Academia: Community Engagement and Leadership

Mr. Alexis Kayiranga's social life transcends academia. He has made substantial contributions to the communities of China and Rwanda in social life. His socio-cultural activities with associates from China and Rwanda demonstrate his spirit of cooperation, commitment to social development, and promotion of community health.

Mr. Alexis Kayiranga actively participates in or organizes activities outside of academia, indicating his spirit of cooperation, commitment to social development, and promotion of community health in both China and Rwanda.

To reach **Mr. Alexis Kayiranga** for inquiries related to his research, teaching, or collaborations, you can contact him through his official e-mail or connect with him via his professional social media profiles or academic platforms

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