

## **Biodiversity, Beers, Bitters, Beverages, and a Bag of Crisps (5Bs Products)**

Principal Investigator (PI): **Elias Bizuru**, Professor at University of Rwanda,

Tel: +250 788 576 052, e-mails: [e.bizuru@ur.ac.rw](mailto:e.bizuru@ur.ac.rw) and [ebizuru@gmail.com](mailto:ebizuru@gmail.com)

Co-PIs: Jessi Flynn, Kweza Craft Brewery, Dr Kabera Justin, Rwanda Forensic Laboratory (RFL)

### **Specific Aims:**

Rwanda lies within the biodiversity hotspot of the Albertine Rift and is extremely rich in plant species diversity. More than 100 plants species are known to produce essential oils and some species co-evolved with yeasts and bacteria that can be valorized to produce new competitive food and beverages. Several plants species are locally known to produce useful bitters, spices, food enhancers and preservatives. Most of these plant resources are underutilized at industrial level to produce commercially competitive food and beverages despite their proven high potential and traditional use by African populations, specifically in Rwanda.

The **University of Rwanda (UR)** Center of Excellence in Biodiversity and Natural resources Management, **Rwanda Forensic Laboratory (RFL)**, **National Industrial Research and Development Agency (NIRDA)** have formed a partnership with **Kweza Craft Brewery**, **Winnaz Crisps/ Hollanda Fair Foods** industry partners, as well as **Rwanda Cultural Heritage Academy** as Community Based partner to connect traditional knowledge with commercial potential. This is to assist in valorization of traditional knowledge, and we are very confident that these collaborations will be able to conduct research and innovation that results in new products that will have good market-based demand with large scale potential.

This project will develop new products, strengthen the bioeconomy, promote “Made in Rwanda” products for both national economy and exports, protect biodiversity, and promote traditional knowledge systems, all through collaborative research and product development. **The overall project aim** is to valorize Rwanda’s native biodiversity through the production of new commercially competitive food and beverages improved with scents/aroma and fermentation sources from indigenous plant species creating unique “*Made in Rwanda*” products. **The specific objectives** are:

- i. To isolate from plant species and produce efficient new yeasts and other fermentation agents for alcoholic flavored and appropriate beers, as well as dairy products enhanced with aromas and tastes;
- ii. To develop natural flavors enhancers for non-alcoholic beverages like milk, teas, coffee and juices;
- iii. To develop seasonings for food products such as crisps, dry rubs, and spices including preservatives, dried fruit, and other different similar seasonings;
- iv. To domesticate and conserve ex-situ the plant species used for fermentation agents and seasonings production

**The approach** of this project will start with documented native plants species known for their high potential and safety. The raw material will be collected from the field and extractions, experiments and tastings conducted in Labs. Confirmed made in Rwanda 5Bs products by Food and Drug Administration (FDA) and Rwanda Standards Board (RSB) will be showcased to the large audience for marketing purposes, and if proven be scaled up.

The outcomes of this project are **production of new prototypes of beer, wine, food and soft beverages** like juice and milk enhanced with new flavors and aroma (bittering) extracted from local plant species. Secondly, there will be **production of new fermenting agents** like strains of yeast and bacteria essential for milk, beer, wine, and other food products fermentation. All these strains will be isolated from indigenous plant species known locally to accelerate fermentation of milk and honey. **The expected impacts** are new commercially competitive food and beverage products developed, economic and job opportunities developed for the full food and beverage/ biodiversity supply chain, and a deeper appreciation and protection of the rich plant diversity and traditional knowledge in the country. Total Project Budget is 89,200,000 RwF including In-Kind Contribution of partner industry for a **duration of 18 months**.

## Additional information

### Investigators/Institutions

**Dr. Hilda Vasanthakaalam**, Associate Professor, Department of Food Science & Technology, School of Agriculture and Food Sciences, University of Rwanda, a Food Scientist/Nutritionist/Food Product Innovation;

**Dr. Justin Kabera**, an expert in Chemical composition of plant extracts, including essential oils;

**Dr. Clement Bitwayiki**, an expert in Technical Sciences “Biotechnology for Food Products.

**Dr. Ndayambaje Jean Bernard**, responsible for extracts, essential oil distillation;

**Ndagijimana Andre**, an Expert in Natural Product Analysis and a Researcher Assistant in Pharmaceutical and Chemistry at National Industrial Research and Development Agency (NIRDA);

**Munyaneza Emmanuel**, a Natural Sciences Research Specialist, Rwanda Cultural Heritage Academy - documenting and valorizing traditional knowledge;

**Gael Van de Weghe**, a Natural History, Ecologist, Photographer, Entomologist;

**Jessi Flynn**, from Kweza Craft Brewery from Beer/ alcohol beverages;

**Debby Leatt**, from Kweza Craft Brewery: Food/ non- alcoholic beverages;

**Thijs Boer** from Winnaz Crisps / Hollanda FairFoods: Seasonings for food products

**Deborah Cyuzuzo**, research fellow and Project Coordinator

