KUBEKO LOW-COST BIOWASTE PROCESSING SYSTEM DESIGNED BY THE LONO COMPANY IN COTE D'IVOIRE

The LONO company based in Abidjan, Côte d'Ivoire, is developing the Kubeko system, a low-cost processing equipment designed for smallholder farmers to efficiently manage and generate income from biowaste. In July 2021, the chemical engineer Noël N'guessan, designer of the Kubeko technology, won the Royal Academy of Engineering's 2021 Africa Prize for Engineering Innovation.

LONO is a bioprocess engineering company providing solutions for smallholder farmers and agro-industries to valorize their waste. N'guessan and his team designed and patented Kubeko to assist smallholder farmers and their cooperatives to generate additional income from the by-products of their harvests. Biowaste represents two to five times the quantity of crops or produce sold, amounting to 30 million tonnes of waste annually disposed in Côte d'Ivoire. Cocoa beans for example represent only 10% of the total harvest while the remaining 90% made up of pods and fermentation liquid currently left to rot in the fields, can be used to produce compost and biogas. By repurposing this waste, Kubeko can help generate extra income, considerably improving the lives of thousands of farmers and their families.

The Kubeko system is composed by specifically designed equipment to ferment agricultural post-harvest by-products. In particular:

- The composter transforms organic agricultural biowaste as cocoa pods, cassava peels or palm fibers into quality compost in 4 weeks. The Kubeko Composter produces about 1500 kg of solid and 500 liters of liquid compost per year. It reduces the space and physical activity required in traditional composting and through its water circulation, it allows farmers without a nearby water source to still efficiently produce compost. The equipment for aeration can be configured to run on an energy grid or on solar power.
- The biodigester transforms all types of green waste (liquid and solid) into cooking gas and liquid compost. Approximately five kilograms of daily solid waste provides two hours' worth of cooking gas, and 50 liters of liquid compost.

The solid and liquid compost can be used by farmers for their agricultural crops, on nurseries and trees production. The fermentation process of agricultural post-harvest by-products is also used to develop biopesticides, as separated products. All organic fertilizers and pesticides, produced using natural byproducts, will help farmers to improve the fertility of the soil.

LONO was founded in 2016 to offer sustainable and affordable solutions to transform waste into value. The company offers services and products that support farmers and their cooperatives, agro-industries, companies and organizations to make the most of their waste. LONO offers advice and executes studies in the field of renewable energy, biomass, biofuels, agriculture and development

impact. In close collaboration with the Polytechnic University of Yamoussoukro, LONO studies and tests opportunities for waste-to-energy solutions and biofuel production, researching different types of locally available feedstock. One of the studies under way, for example, concerns the possibility of using the hyacinth covering the lakes of Yamoussoukro in Côte d'Ivoire as a renewable raw material to produce methane and compost.

The Kubeko system is one of the relevant results of the LONO company. Adopting a circular economy approach it can be used to convert biowaste from the most important agricultural products in the country as cassava, cocoa, palm oil, mango, to compost for soil fertility and biogas for cooking.

Since being shortlisted for the Africa Prize in February 2021, the Kubeko team has made progress in reducing its production costs from US$800 to US$700, making their products more affordable.

The Kubeko team at LONO company has installed to date two biodigesters running on cassava farms. 50 composters have been installed on cocoa, palm oil and mango farms.

The LONO company has also been commissioned by the Ministry of the Environment and Sustainable Development of Côte d'Ivoire to train farmers and all interested stakeholders on the use of Kubeko, as part of the department's national composting and biowaste strategy. Within the next five years, the company aims to reach 10% of the 2 million smallholder farmers in Côte d'Ivoire that are facing decreasing yields and stronger market demand for sustainably produced crops.

Since 2014, the African Engineering Innovation Award is organized every year by the Royal British Academy of Engineering to stimulate, celebrate and reward innovation and entrepreneurship in sub-Saharan Africa. The Prize provides financial support to African innovators who develop engineering solutions to solve local challenges. In particular, the Prize selects innovators from across the continent and after an eight-month period of tailored training and mentoring to help the selected innovators accelerate their businesses, the process culminates in an event where the winners are announced and rewarded. Since its launch, the Prize has supported projects that should impact close to three million people and generate 500 jobs. An interactive tool of the website allows to know the shortlisted entrants, finalists and winners of the Africa Prize for Engineering Innovation selected by engineering category, country, year and UN Sustainable Development Goal.

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Article in stratmarques.com

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