WEST AFRICA

KUBEKO – The mobile biodigester transforming organic waste into biogas and fertilizer

Côte d'Ivoire remains an agricultural country, with the sector contributing 20% of GDP. It is a world leader in the global value chains of cocoa, cashew nuts, rubber, and several other agricultural products. The agricultural sector generates between 20 and 30 million tons of field and process residue each year, which does not yet contribute to the local economy.

Background

LONO is one of the innovating companies selected through a call for innovation by the West Africa Hub of the WE4F (Water and Energy for Food) programme whose main goal is to scale up water and/or energy friendly innovations in the agroindustry sector.

It was founded in 2016 in Côte d'Ivoire with the conviction that all countries and communities should benefit from innovation and technology. The company, which employs 12 people, strives to adapt existing solutions to the local context by offering sustainable and affordable solutions to transform organic waste into a valuable resource. To achieve this, LONO offers services and products that support farmers, companies and cooperatives in the agroindustry to make the most out of their waste.

Furthermore, LONO conducts feasibility studies to determine the possibilities of waste valorization, considering the advantages and inconveniences of each approach. By researching different types of locally available feedstock, the company also explores the best waste-to-energy and waste-to-compost solutions.

Innovation

LONO developed and is popularizing local technologies that allow raw organic waste material mainly from the agroindustry sector to be transformed directly on-site into energy products and organic fertilizer.
One of the proposed flagship products is the "KubeKo", a mobile biodigester that transforms all types of organic waste into biogas and liquid fertilizer. With the input of 5 kg of waste per day, the KubeKo can produce 50 liters of liquid fertilizer and enough biogas that allows for up to two hours of cooking.

FACTS

- Biogas could cover around 20% of global energy demand, but currently supplies only around 3%.
- As of 2019, around 90% of the population in Côte d'Ivoire uses wood and charcoal for cooking.
- In Côte d'Ivoire, cotton and cocoa alone account for more than 60% of annual fertilizer consumption, bananas, oil palm and sugar cane for about 20% and cereal & vegetables for 20%.

Photo credits: GIZ

LONO offers two models for the KubeKo:

- a biodigester of 1m³ designed for households can produce up to 4 hours of cooking gas and enough fertilizer to cover an area up to 2 ha;
- a community version of 16 m³ for 30 households with a production capacity of up to 50 hours of cooking gas and fertilizer to cover an area up to 30 ha.

The KubeKo biodigester is best suited for the agroindustry sector as different agricultural waste from banana, cocoa, cassava, palm, fruits & vegetables etc. or abattoir waste can be used in addition to animal manure which is needed to operate the biodigester. This makes it also suitable for agricultural households with livestock as manure is already available on site. The company also provides training sessions to farmers on how to use the KubeKo and how to best apply the fertilizer.

Advantages and impacts so far

- The KubeKo biodigester has already been installed at various sites in Côte d'Ivoire where it benefits 1) a cooperative of women who use the biogas to cook attiéké (a cassava-based dish) and the fertilizer to fertilize the cassava as well as vegetable plants, 2) a group of mango smallholder farmers using the liquid fertilizer for the mango trees while the biogas is used by the farm workers to cook food onsite, 3) a private agropastoral farm that has opted for biogas as fuel for its fruit dryer 4) a cocoa and plantain banana plantation, where the organic fertilizer is re-applied to the plants and enriches the soil for a higher productivity and 5) school canteens in Abidjan where the biogas is used for cooking while the fertilizer benefits the schools' vegetable gardens.
- LONO plans to set up 25 demonstration sites made of both domestic and community biodigesters in agricultural areas throughout Côte d'Ivoire to build the capacity of small producers, processors and other potential users.
- Decrease deforestation: The KubeKo biodigester converts organic waste (solid or liquid) into biogas for productive use. Using biogas created from locally available organic waste reduces the need to cut for or purchase firewood, which saves time and money in addition to helping protect the environment by decreasing deforestation.
- Promotion of circular economy: The use of biodigesters to produce biogas and fertilizer contributes to addressing the issues of waste management and soil fertility by creating value from what is considered waste. It also contributes to achieving the goals of the integrated national strategy for the promotion of circular economy 2023-2027 as well as its action plan that the Ivoirian government is working on.

Photo credit: LONO

GOALS AT A GLANCE

- Valorize organic waste by producing biogas for agro-industrial transformation and domestic use
- Produce local, organic fertilizer by using agriculture waste products
- Reduce deforestation as well as the use of chemical fertilizers & fossil fuels
- Make gas and fertilizer accessible to rural areas
- Contribute to waste management and circular economy

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More about the global initiative Water and Energy for Food (WE4F) Grand Challenge: https://we4f.org/

Further information about the innovation: https://we4f.org/innovators/lono

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