



Zero-waste Circular Economy Model & Block chain Agritech In Management Of Post Harvest Losses In The Avocado Value Chain



PRESENTER
FLORENCE ALICE MATHINGAU

JULY 2024

Introduction

Company formed in 2014
Upgraded to LTD in 2016
Aggregators of sorghum with 2000 contracted farmers in Kenya for EABL
Diversified to agro processing due to COVID 19 pandemic with 12000 avocado farmers



Transformation of land & livelihoods



Using the zero waste circular economy model , eradicate avocado post-harvest losses in Africa



To manufacture products from avocado wastes which enhance regenerative agriculture and reduce post harvest losses, land degradation , protein deficiency, and greenhouse gas emissions

Factors influencing post harvest losses

The lack of **avocado traceability** can significantly impact **post-harvest losses**. How?

1 Quality Assurance and Traceability:

- **Traceability** the ability to track the movement of a product from production to consumption. It involves recording information about the origin, handling, and distribution of the product.
- When there is **lack of traceability**, it becomes challenging to monitor and manage the quality of avocados during post-harvest operations.
- **Quality assurance** relies on accurate traceability systems to ensure that avocados meet the required standards for freshness, appearance, and taste.

2 Handling procedures

- **Poor harvesting practices:** Inadequate handling during harvest can result in bruising, damage, and reduced quality.
- **Poor storage practices:** Improper storage conditions (temperature, humidity, and ventilation) can accelerate ripening, spoilage, and decay.
- **Inefficient transportation systems:** Lack of traceability affects the efficiency of transportation, leading to delays and suboptimal conditions for avocados.

■ Determinants of Post-Harvest Losses:

Factors like sex, education, income, training and contact with extension workers

Storage accessibility and **harvest techniques** also play a crucial role in minimizing losses.

Implementing traceability systems can help address these determinants by improving overall handling practices.

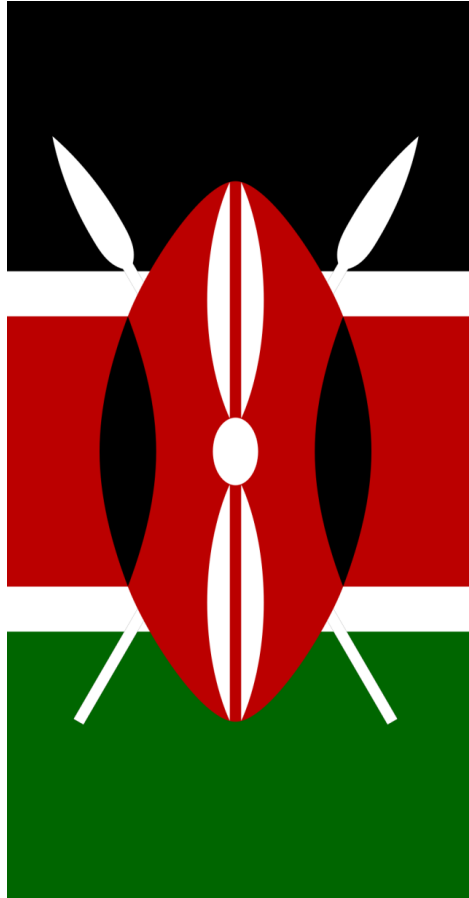
■ Economic Impact: of post harvest losses

- Post-harvest losses contribute significantly to **food insecurity** and create economic challenges for both producers and consumers.
- When avocados are not traceable, it becomes harder to identify the source of losses and take corrective actions.
- The lack of traceability hinders effective supply chain management, leading to increased wastage and reduced income for farmers





30% of Kenyan farmers grow Avocados



1 Post harvest losses



- Losses-Exporters uptake Hass variety-20% production , 30 000 to 40 000 tons waste (USD92.4M annual loss)

2. Lack of traceability



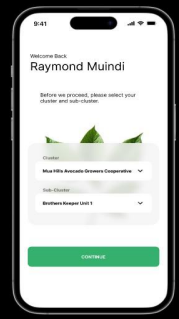
- Leads to rejects for Hass avocado at export pack houses thus more wastes



1. Aggregation of non export avocado varieties from 12000 farmers in East Africa, low grade rejects from export pack houses , agriwastes from market dumpsites



2. Value Addition using zero waste circular economy model to different products



3. Block chain software to enhance traceability





Avocado Oil



Black soldier fly larvae



Briquettes



Avocado seedlings

www.shutterstock.com - 1078506836

1. Farmers organization/Aggregation Model

2. Block chain Agritech Software



Contracted
FARMER
2 ha land



Group

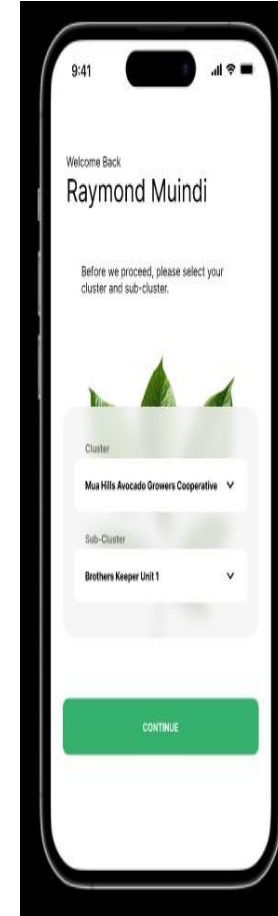


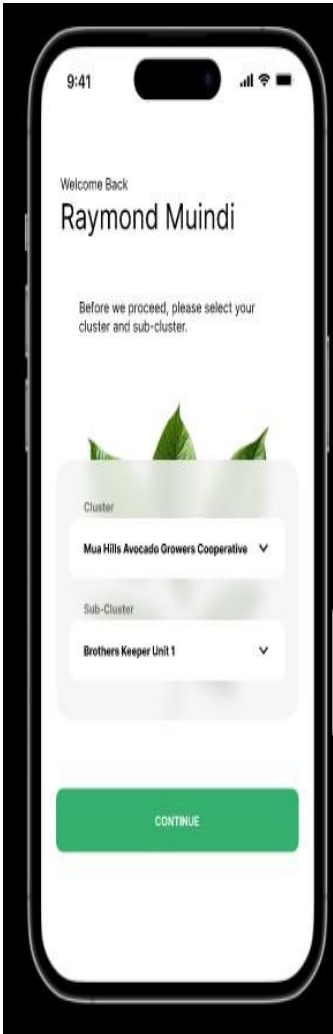
Clusters
formed by
many farmer
groups



Ten farmers
Brothers
Keeper Units

Aggregation Centre





HOME SCREEN

- Data about the farm-Acreage, Avocado variety, Number of trees, Current weather predictions, Status of Smart contract

PROFILE

- Bio data,-Name of the farmer, Gender, Age
- Smart contracts., Terms and Conditions
- Geospatial map-Farm Location. Cluster, Sub cluster

AI Agronomical support feature

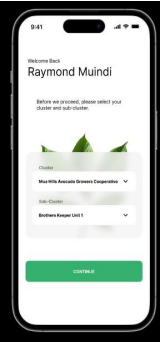
- AI backed support feature, image recognition feature, offers tailored verified information on the uploaded photo/video images disease causes and remedy measures,

Transactional Data

Avocado volumes produced, quality, quantities delivered , buying price per kg, total sales , mode of payment-either MPESA mobile money or bank account

Stakeholders

Linkage to Suppliers of essential services like agri insurance, certified organic inputs, finance, Market etc who have rights to access data relevant to them, securely stored and the data blocks cannot be altered/ edited



- enhancing traceability in the avocado supply chain is essential to reduce post-harvest losses, improve quality, and ensure sustainable production and consumption
- The Block chain integrates cutting-edge technologies like Block chain, AI, geospatial mapping, and USSD
- Blockchain is one stop shop where farmers access essential services
- The Blockchain technology ensures transparency, traceability, quality assurance in the entire value chain.
- Its user friendly, accessible for farmers in remote areas with limited tech expertise
- Promoting sustainable practices in agriculture by providing a transparent and tamper-proof platform for recording and verifying data on environmental impact, land usage, and crop yields.
- Enhancing food safety by allowing information to be traced across the avocado agricultural supply chain.
- Providing an efficient and reliable solution to the urgent need for product traceability and controlling supply chain.
- Creating an immutable record of transactions or events, which is particularly helpful in creating a trusted record of land ownership for farmers.
- Allowing peer-to-peer transactions to take place transparently and without the need for an intermediary like a bank (such as for crypto currencies) or a middleman in the agriculture sector.



Improve Livelihoods of 12,000 farmers
80% women



Market Linkages 12000 farmers

Land Restoration/reducing land degradation
Restored 24000 acres with 9.6million trees in
East Africa

Reduced protein deficiency
via BSF larvae farming

Block chain software
Traceability

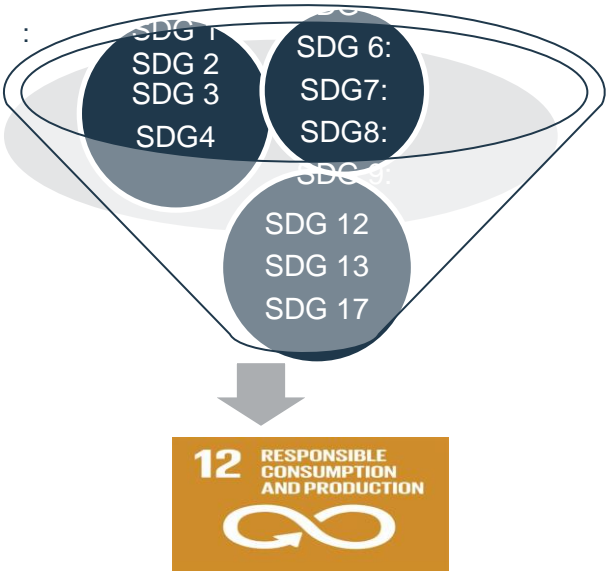
Carbon sequestration

Linkage to insurance, finance , inputs
AI Backed agronomy, Sharing secured data

Address 14 SDGs

Reduce green house gas emission by replacing
firewood/charcoal with briquettes

SDGs ADDRESSED



Kenya abides to Malabo declaration to reduce food loss and waste by 50% by 2023

FOUNDER /MD



Florence Alice Mathingsu PHD
 MPH, AGRIBUSINESS FINANCE SPECIALIST
 AWARD WINNER 2014
 Africa's Most Influential Women in Business & Government

BOARD OF DIRECTORS



Dr. Esther Nderitu
 PHD-ACTUARIAL SCIENCE



Daniel Muturi
 M.A ECONOMICS

TECHNICAL ADVISORS



SAVERIO DANUBIO
 Waste Management Specialist
 WRI Land Accelerator-Italy



Dr. Rajhit Dhooria
 Entomologist/ R&D
 CEO Catalyze Canada

TEAM

SENIOR STAFF



Patricia Aswani
 PRODUCTION
 BSC MICROBIOLOGY



PENINA MUTUKU
 FINANCE/ADMINISTRATION
 MBA



Nancy Kaburu
 IT
 COMPUTER SCIENCE



Sam Owino
 Blockchain Expert
 Software Engineer

CHALLENGES

- Financial-Working capital. Machinery
- Technical-Product development
- Founder is PLWD
- Cultural



Product Development partners



Finance Partners



Farmers support



Agri Tech Partners



Business/Finance Modeling



Compliance Partners



Farmers/primary producers
End user/market



Benefits	Agri-Business Solutions	Olivado	Mt. Kenya Avocado Oil	Old Land Trade Company
Innovation	√	X	X	X
Technology Competence	√	√	√	X
Product Quality	√	√	X	√
Pricing	√	X	X	X
Waste disposal	X	X	√	√

Competitive advantage

- Unique model-zero waste circular economy-Most competitors process oil and use wastes for biogas or animal feeds. We are the only SME doing briquettes ,planting seedlings and black soldier fly farming
- The only SME having developed the block chain software for enhancing traceability in the avocado value chain



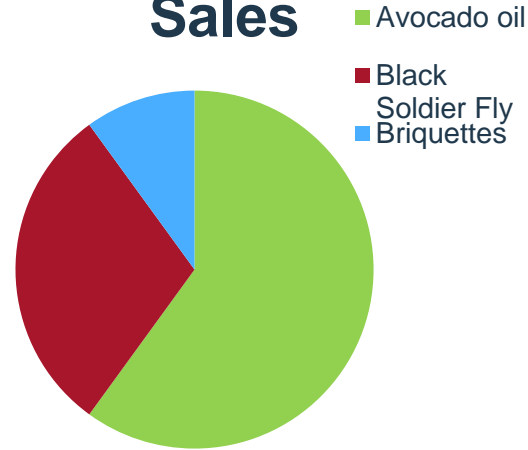
Milestones

- Zero waste circular economy Model
 - Generating revenue
 - profitable/qualified staff

Certification



Sales



Key clients

3 Export Market
4 Corporates
Individuals 1000 +



12000 contracted farmers
Total Production 768 000 tons
Uptake 40%

Traction

- **Product Development**
 - Product segmentation
 - **OIL**
 - Cosmetics
 - Edible
 - **Briquettes 4 types**
 - Barbeque, Poultry brooding, cooking , Boilers
 - **MVP Block chain**





THANK YOU!

 FLOALICE63@GMAIL.COM /
AGRISOLUTIONSLTD@GMAIL.COM

 [HTTP://AGRIBIZZSOLUTIONSLTD.WORDPRESS.COM](http://AGRIBIZZSOLUTIONSLTD.WORDPRESS.COM)

 Nyati Drive off Katani Road, Katani Machakos
County

