2nd Calestous Juma Legacy Seminar on Steering Science, Technology and Innovation to Achieve Sustainable Development Goals

November 29-30, 2021

Entrepreneurism in Aquaculture

29th November, 2021

Busia County

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Africa Food Systems Leadership Program

Aquaculture & SDGs by 2030

Sustainable Development Goals (SDGs)

Goal 14:
Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Food and agriculture are key to achieving the entire set of SDGs, and many are directly relevant to fisheries and aquaculture

Trends in Aquaculture in Kenya

- **Growing fish demand globally , Kenya deficit of 500,000 Tons annually, increased cross border conflicts**
- **decline in Capture fishery/ export supplies**

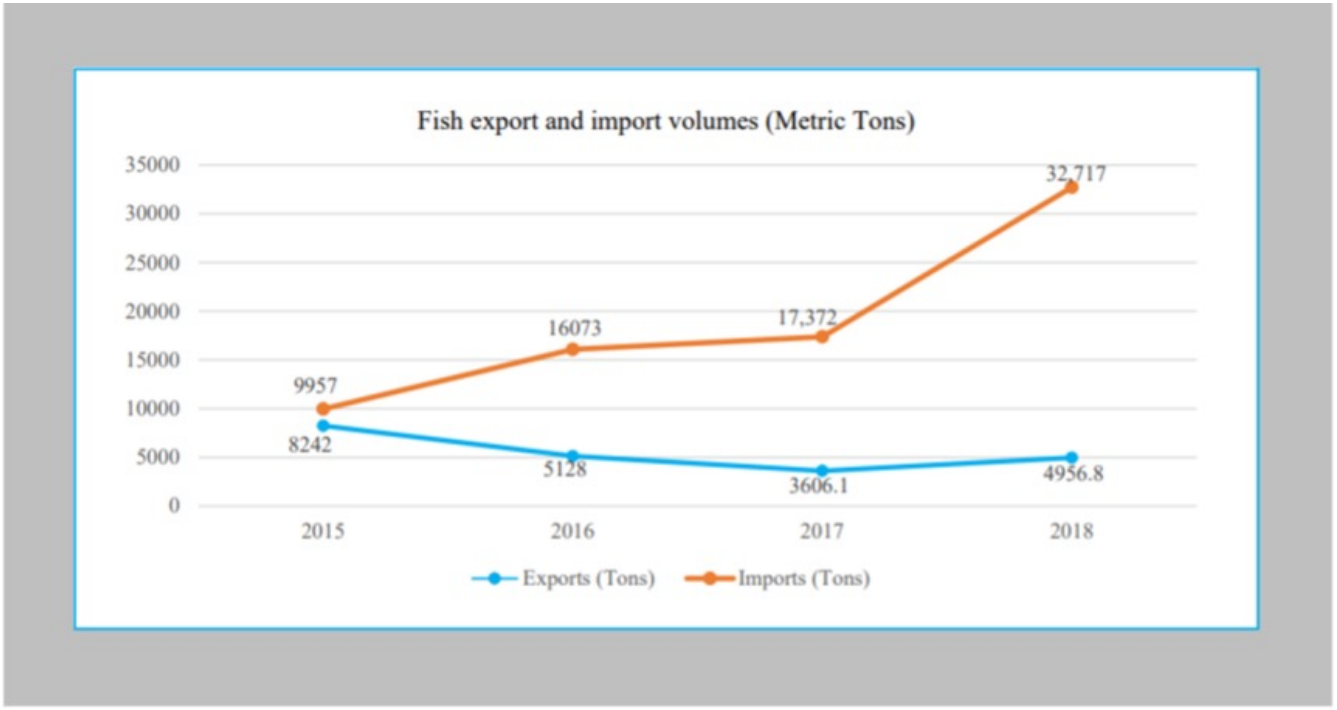


Figure 1.4: Fish import and export volumes (Mt) between 2015 to 2018 (Data: KNBS, 2020)

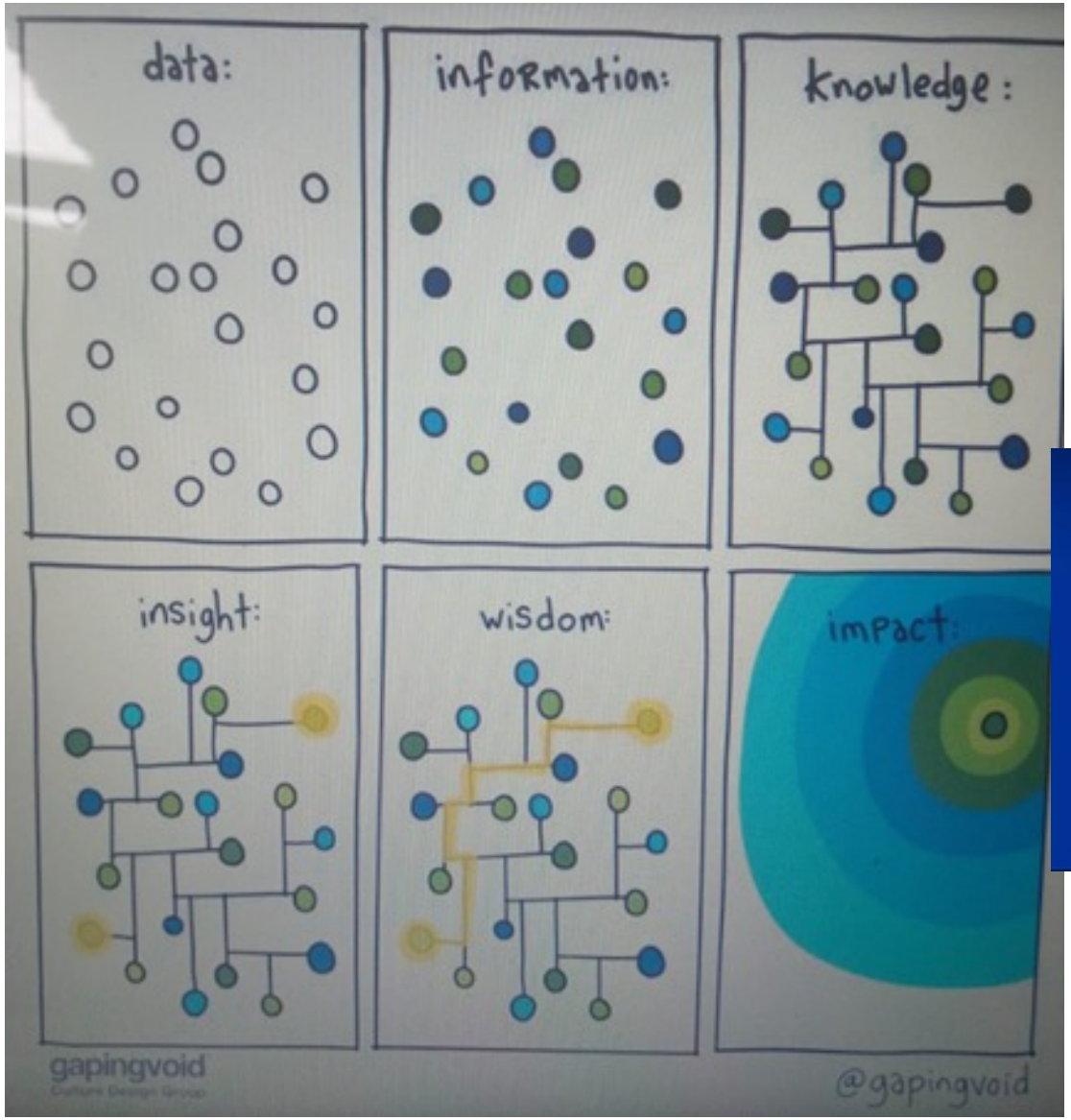
In Kenya Per Capita Fish Consumption is at 4.6 to 5Kgs as of 2020 against global rates of 20Kgs, compared to Japan at 70Kg

Entrepreneurs aim to **Solve That Problem/Pain Point** in Aquaculture through Innovation, new ideas, supply goods/services, procedures.

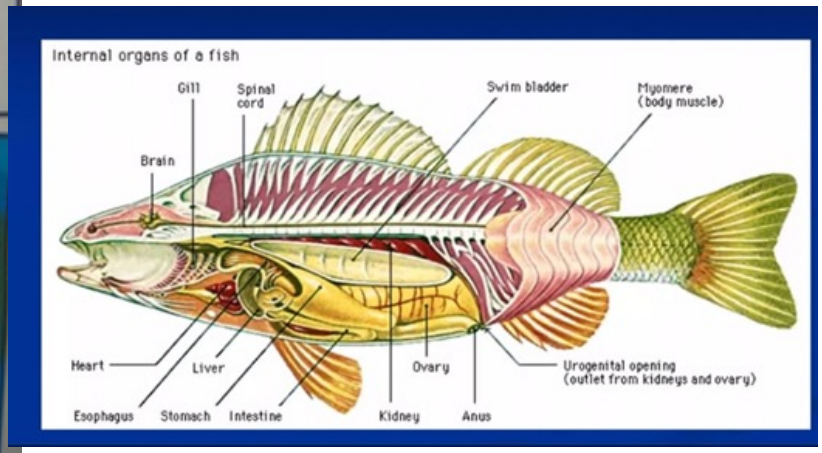
Top 10 Aquaculture Business Opportunities

1) Fish fry production or Fry Nursing to fingerlings
2) Fish Feed production, mixing or aggregation
3) Fish ornamental production & Aquarium set up
4) Fish cage fabrication
5) Fish feeder eg. in cages
6) Fish cooling & Ice flake making
7) Fish Transportation
8) Fishing gear suppliers and repairs
9) Fish Extension services and capacity building
10) Fish traders and value addition

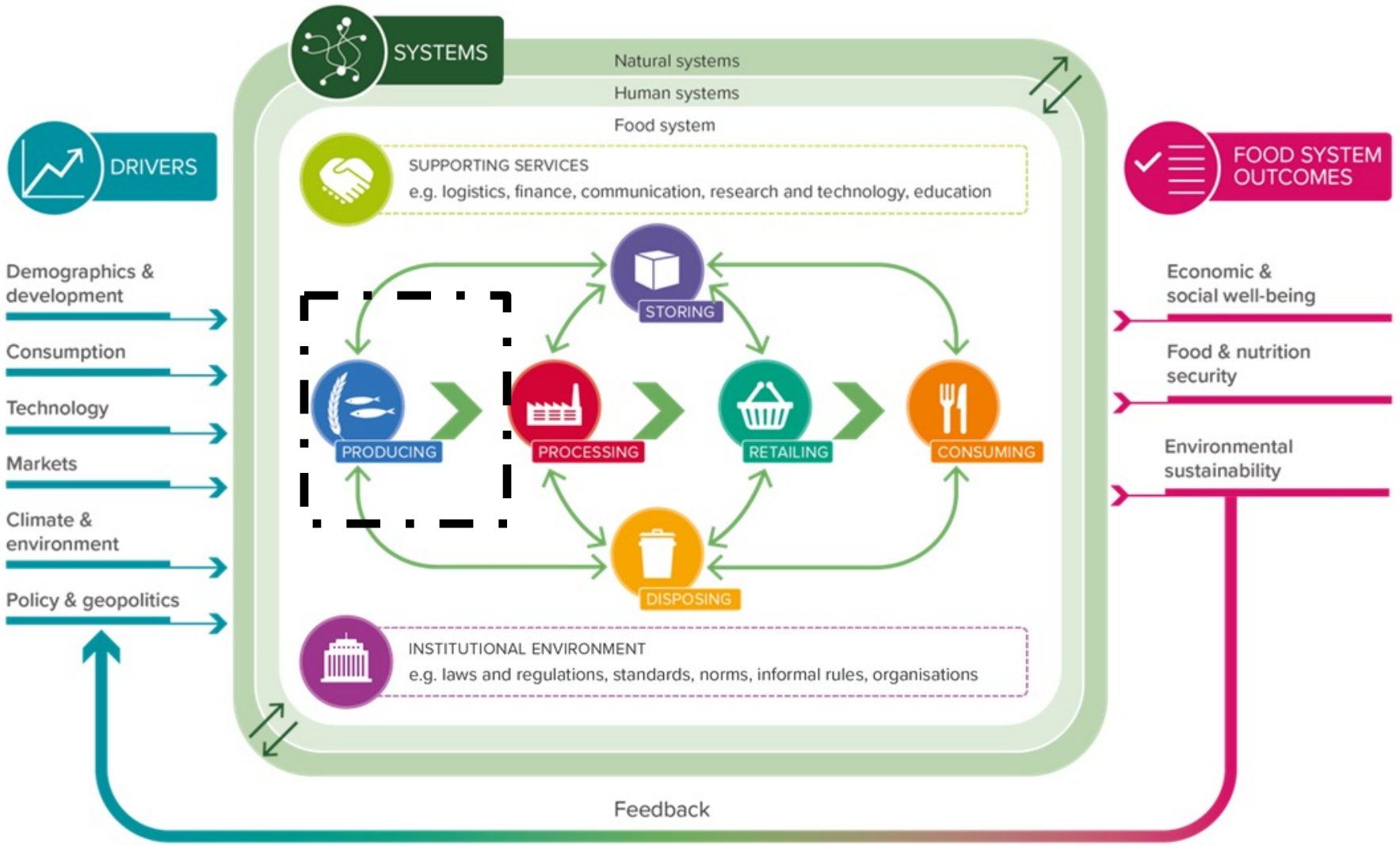
Challenges in Aquaculture
1. Knowledge & Innovations



- Every challenge calls for Innovations
- Take time to evolve when in Business



2: Inclusive Aquaculture in Future Food Systems



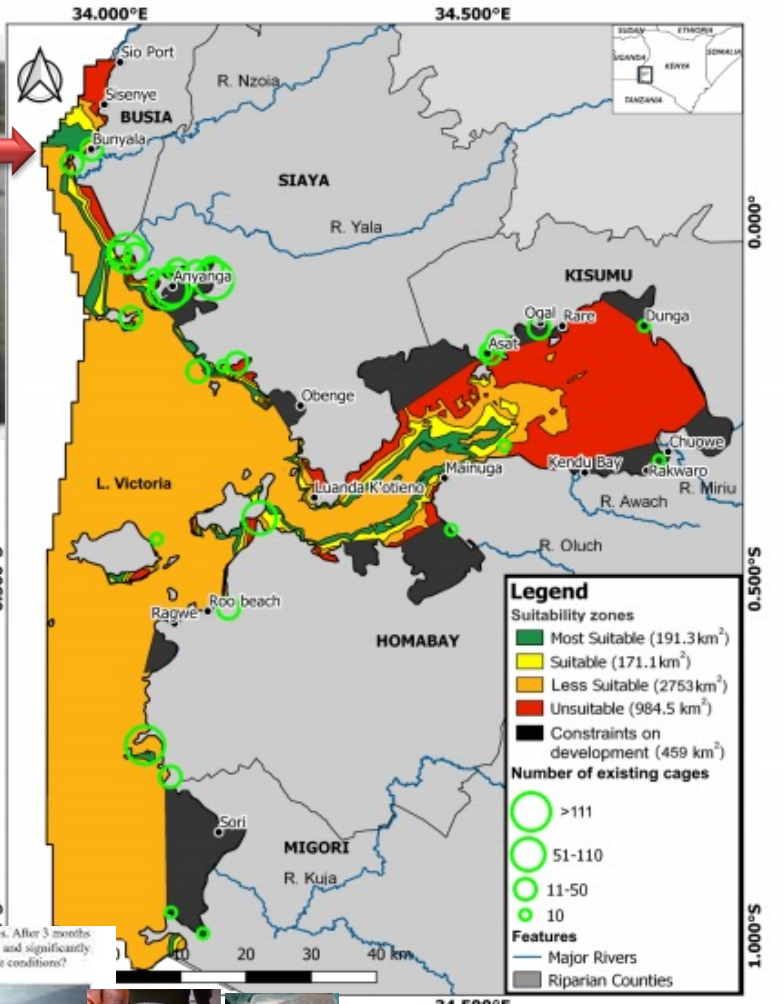
Source: WCDI, Wasafiri Consulting and IKEA

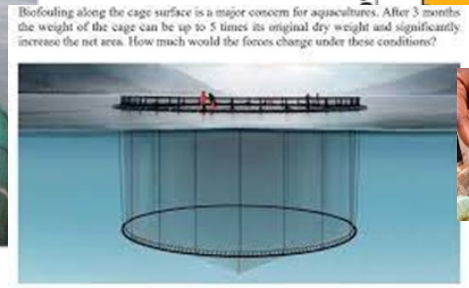
3: Location : Hydro Victoria Fish Farm

HISTORY→ TODAY

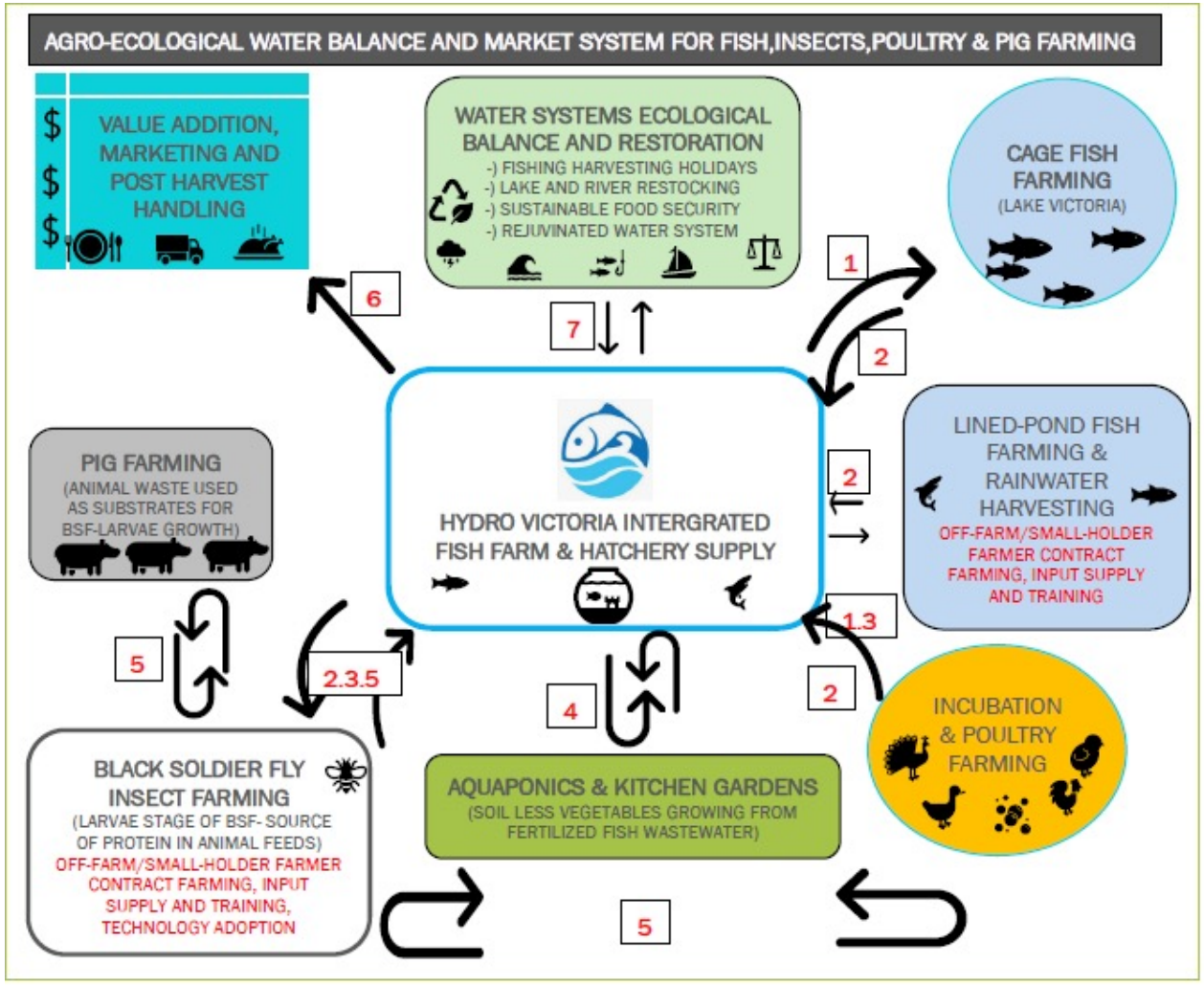
10m Circular Dia =18Ton **FUTURE**
33,000 Tilapia Fish in 6-8months

Most Suitable
191.3Km2
=47,271.3 Acres
Mainly in Busia,
Port Victoria.
(KMFRI)





Hydro Victoria's Social Entrepreneurship



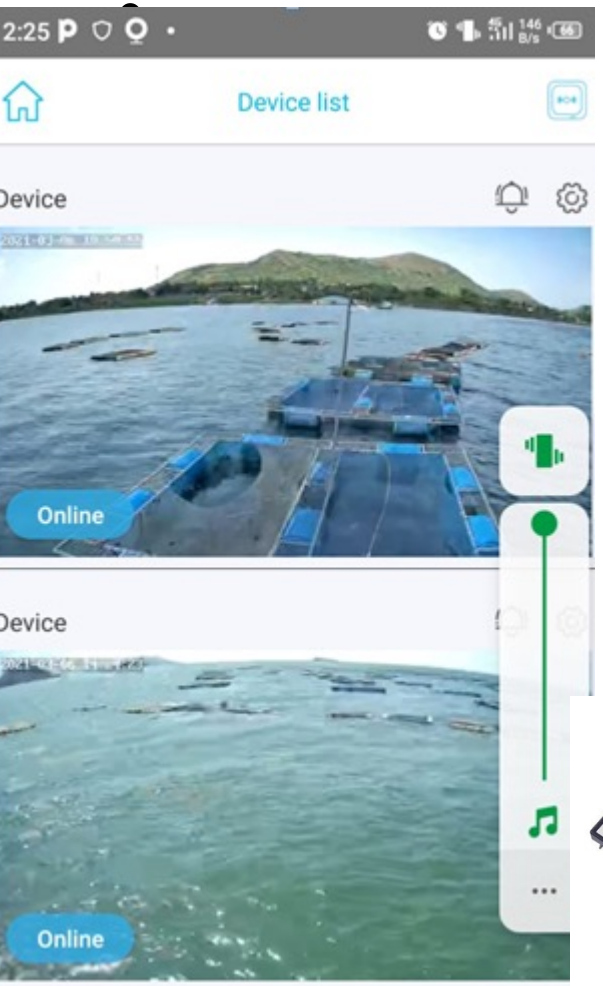
1. Feed and Seed Supply 2. Fish Mortality Waste 3. Farmer Extension Services 4. Fresh-Nutrient Water Exchange (NH4—>NO3+NO2+H2O) 5. Animal Waste vs Feed Exchange 6. Value-Addition 7. Water-balance

HYDRO VICTORIA FISH HATCHERY FARM LTD (KENYA)

- Active since Nov 2018
- Located at Port Victoria, adjacent to L.Victoria
- 40 Tons of Tilapia Fish Annually
- 68 Fish Cages in L.Victoria (Busia/Siaya) Counties
- 12 Employees (9M, 3F)
- 48 Contracted BSF Farmers in Self Help Groups (Women led)
- 2 Fish hatcheries-Busia
- 150Kg -Wet BSF Larvae or 75Kg of Dry BSF Larvae PM
- 1.5M fingerlings Annually
- 2300 Farmers in Western Kenya

Current Innovations & Systems at Hydro Victoria Fish Farm

Uses of solar powered CCTV -4G Internet access and Solar Flood Lighting, IoT-Temperature Sensor Technologies in fish cages Monitoring & Surveillance

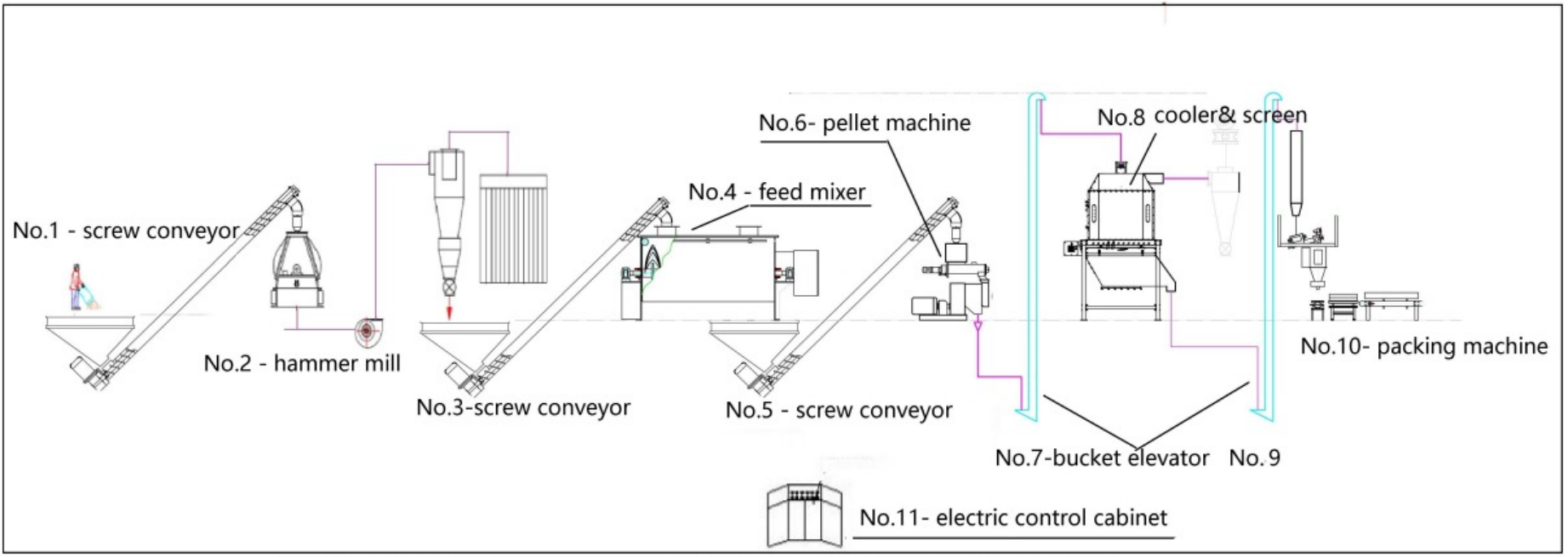


In Pipeline: First Organic Fish Feed Plant in Kenya

**Busia Fish market alone- produces 2Tons of fish offal's waste daily and this is dumped

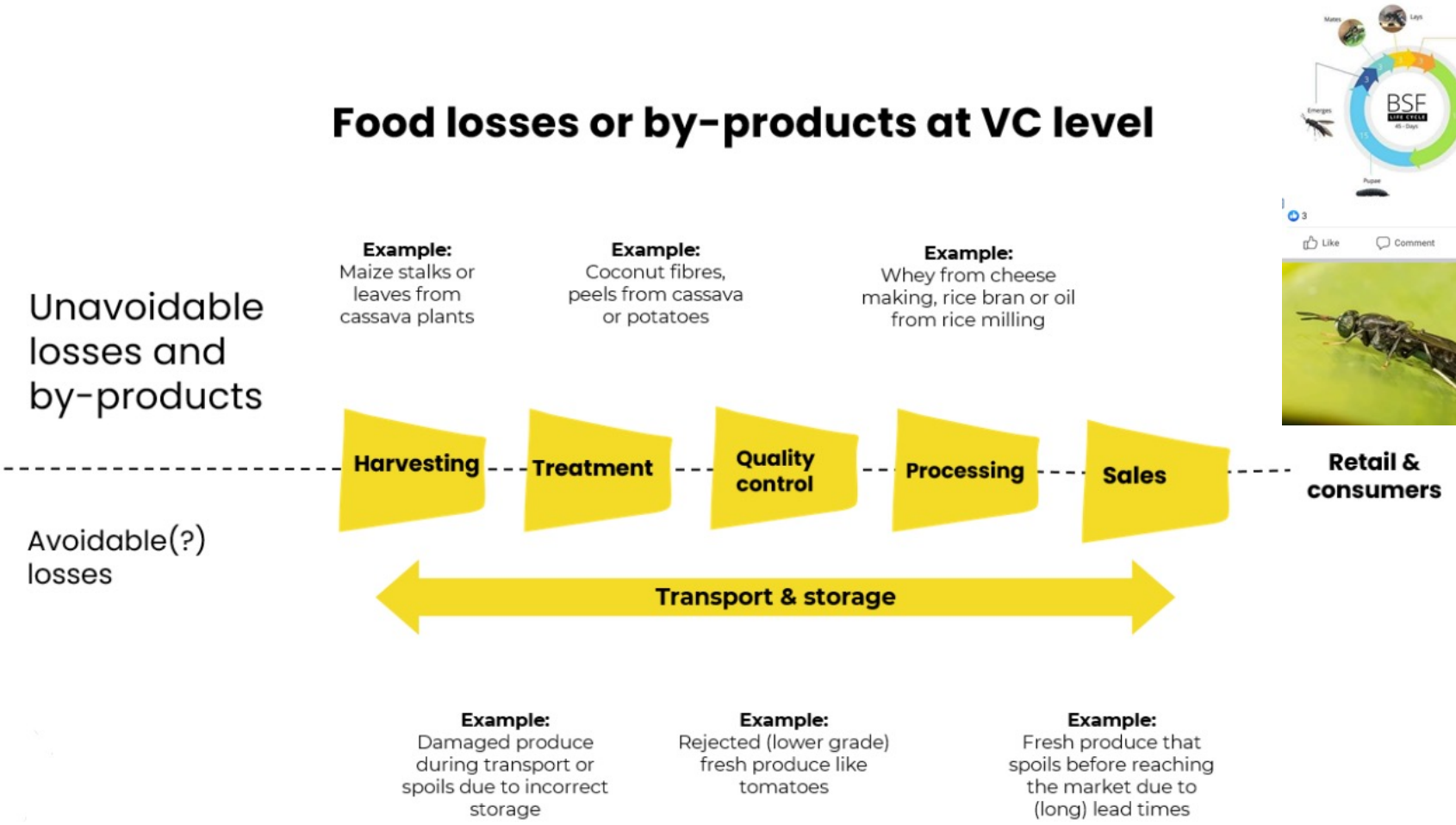
- 2Ton/Hr Capacity Feed Plant
- Located: Port Victoria
- Value chains: Fish/Poultry Feeds
- Main inputs: BSF Insect Larvae-Food Waste to protein, others Rice/Maize
- BSF farmers out grower scheme for targeting 1500 producers within 10 food markets in Busia County.
- Feed Plant Budget: 300K USD
- KCSAP/World Bank/Busia County 100,000 USD -Inclusive Grant)
- 100,000 USD -Hydro Victoria
- 100,000 USD -Looking for partners, donors, Researchers, Experts
- Impact:Over 3500 farmers (fish/Poultry)

DESIGN: Automated 2Ton/Hr Feed Processing



ECOSYSTEM APPROACH

- Strategy: Closing the Loop of consumption



Product Design Principles

We live in a World with Finite Materials, Rethink/Transform from Take →Make→ Waste

By changing our mindset and harnessing new materials and technology on food, to ensure waste and pollution is not created in the first place.

Food Products cannot last for ever, but we can Keep them in circulation, so they don't end up in landfill

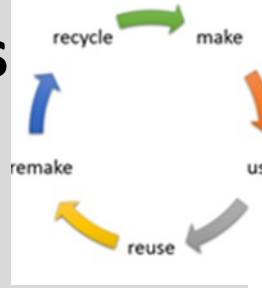
Everything is food for something else. By returning nutrients to the soil and other systems, we can enhance natural resources

Tackle Climate change, biodiversity loss, social needs

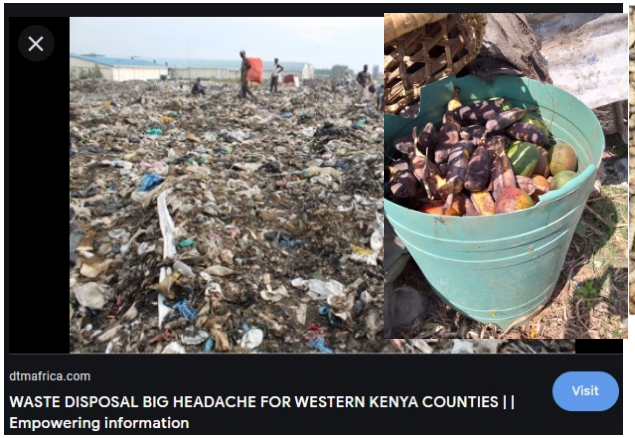
→decoupling profits, & grow prosperity, jobs, and resilience

→cut production cost, greenhouse gas emissions, waste & pollution

→ recover nutrients in soils, energy



TURN WASTE TO VALUE USING BSF

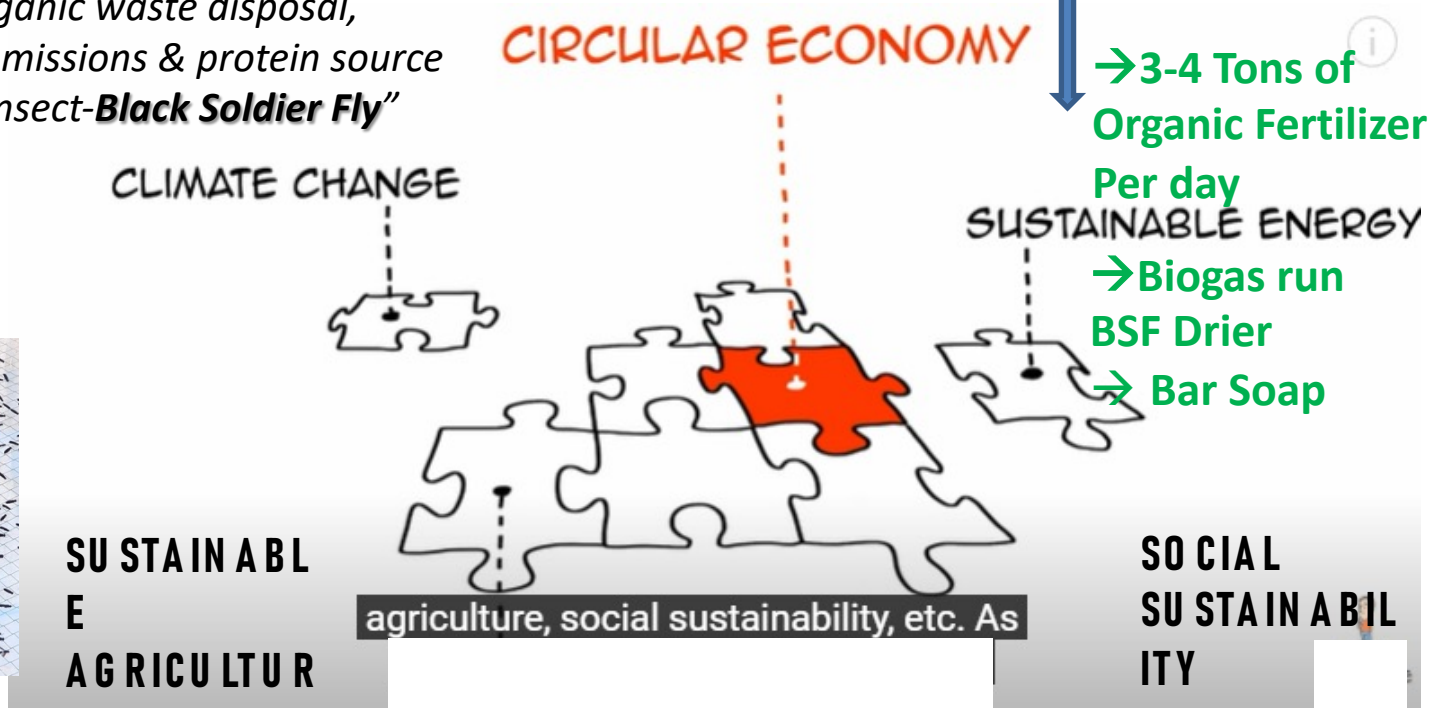


10 Tons of Organic Waste→3 Tons of Wet BSF→ 1.5Ton Dry BSF

*"Solving our problem in organic waste disposal, reduce Food Waste, GHG emissions & protein source for Animal Feed with one insect-**Black Soldier Fly**"*

Food and nutritional security

Economic and Social Well-being



→3-4 Tons of Organic Fertilizer Per day

→Biogas run BSF Drier

→ Bar Soap

Why Insect Based Feed in Our Food systems

***Post-COVID & related Soymeal Import shocks in Kenya**

June-July 2021
30 Companies relying on Soymeal imports in Kenya closed shops affecting thousand of farmers

Economic empowerment to reduce HH level tensions and achieve SDG 16 on Peace

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THANK YOU


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Elizabeth Ojina | Nation Media Group
How to make quality fish feeds on farm
Saturday, March 20, 2021