AICCRA
Accelerating Impacts of CGIAR Climate Research for Africa

Ethiopian Society Of Animal Production
የኢትዮጵያ እንስሳት እርባታ ባለሙያዎች ማህበር

ICARDA
Science for resilient livelihoods in dry areas

# Mechanization of Feed Production: A Strategy for Feed Optimization and Commercialization

Muluken Zeleke, Udo Rudiger and Jane Wamatu

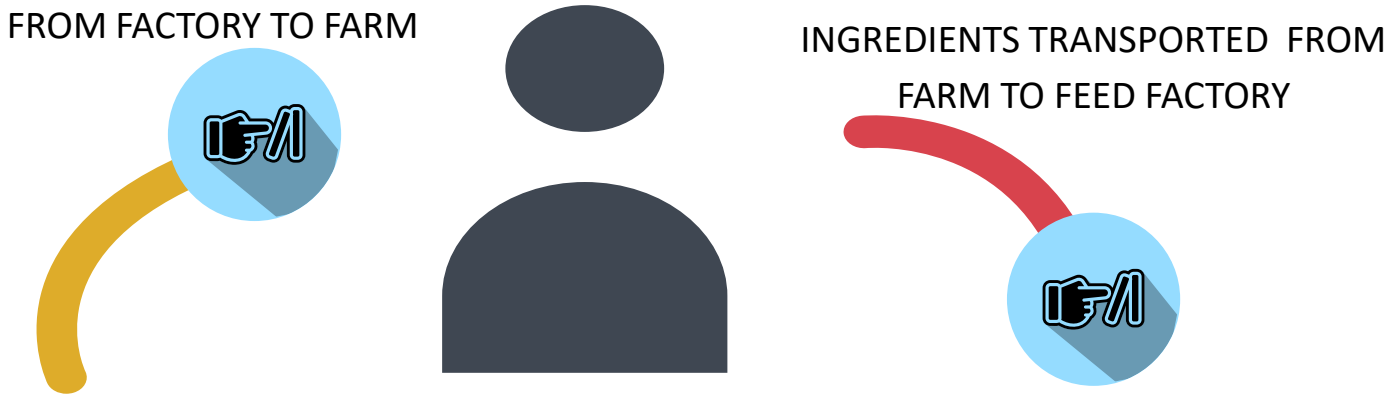
**ESAP 31st**
**Jigjiga University, 2023**

# OUTLINE

- Context
- Challenges
- Intervention and outcomes
- The way forward

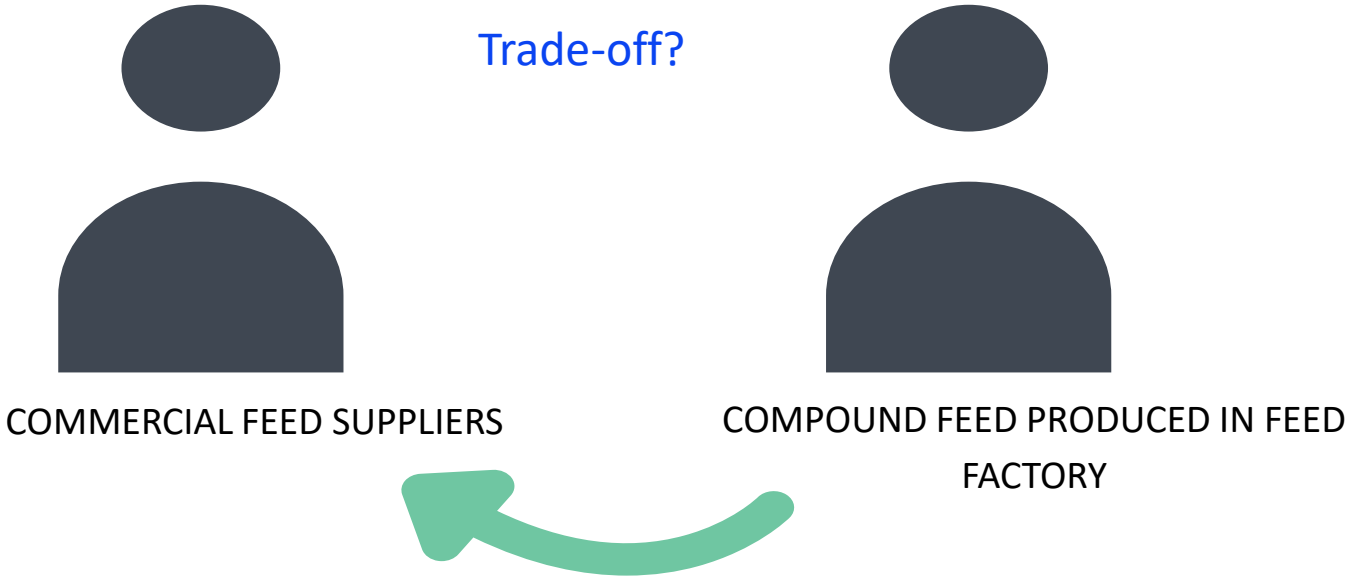
# 1. Context

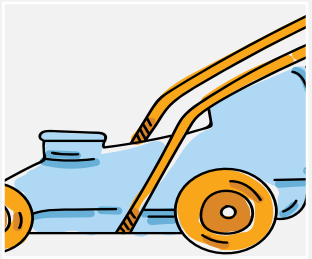
## Feed Ingredients cycle




WHAT IF WE MINIMIZE THE INGREDIENT CYCLING and process at the farm level?

Trade-off?





**Ingredients at farm level:** By-products from grain/root crops processing, industrial by-products, local brewery residues, crop residues, forage crops, etc

In rural areas, small-scale feed mechanisation can be a viable approach to utilise feed resources efficiently

The presentation focuses on exploring the youth groups' small-scale mechanisation and commercialisation of feed at the on-farm level.

# Major Challenges of Feed mechanization in Ethiopia

**High capital investment**

The initial cost of machinery

⇩

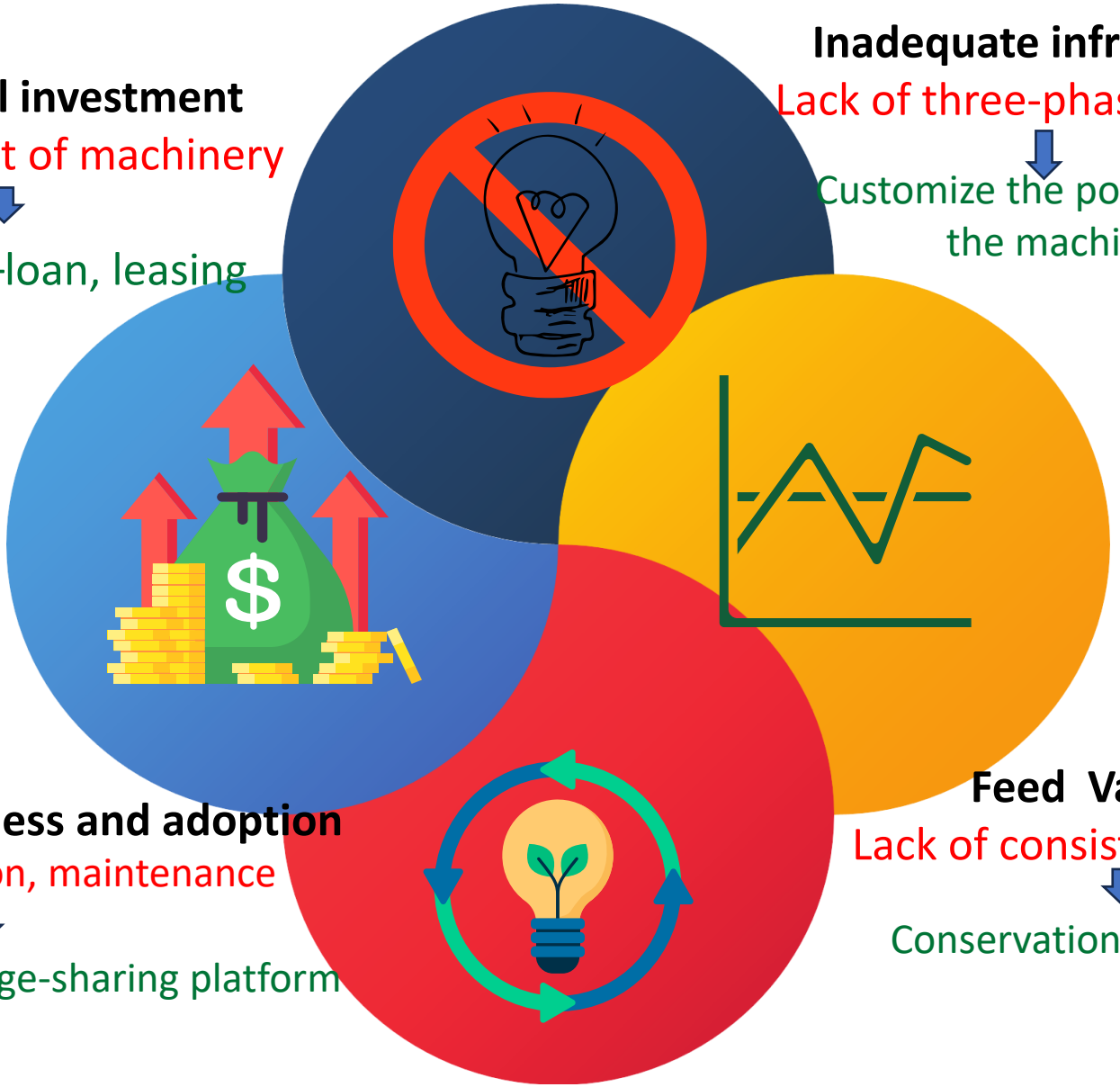
Long term –loan, leasing

**Inadequate infrastructure**

Lack of three-phase electricity

⇩

Customize the power drive of the machinery



**Limited awareness and adoption**

Benefits, operation, maintenance

⇩

Practical knowledge-sharing platform

**Feed Variability**

Lack of consistent ingredient

⇩

Conservation, processing

# In the circular bioeconomy approach, components and interactions to produce feed at the farm level

Feed Mechanization

BARLEY BASED-SHEEP FARMING

1. FOOD-FEED VARIETY SELECTION
2. FEEDING BY-PRODUCTS FOR FATTENING
3. HYDROPONIC BARLEY

ENSET BASED-SHEEP FARMING
FEEDING BY-PRODUCTS FOR FATTENING

Community Radio program

INDIGENOUS FORAGE

RESEARCH PROGRAM ON Livestock

CGIAR

*More meat milk and eggs by and for the poor*

# The Interventions

# ICARDA intervention as a possible solution for abovementioned challenges

**PP-Partnerships :** Encouraging local manufacturing of feed production machinery can reduce dependence on imports and make machinery more accessible and affordable.

**Research :** Investing in research and development to identify and develop feed formulations tailored to the local context can help optimise feed production efficiency.

## Local sourcing and diversification:

Encouraging local production of feed ingredients and promoting the cultivation of alternative ingredients can mitigate the impact of variability and reduce dependence on imported components.

## Knowledge-sharing platforms:

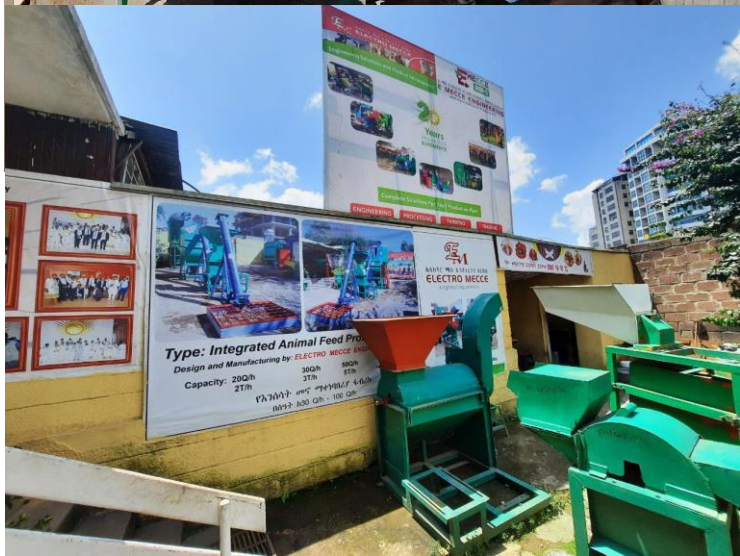
Creating platforms for sharing success stories, case studies, and best practices related to mechanization in feed production can facilitate knowledge exchange and inspire adoption.

## 1. Public-Private-Partnership

**Government:** provide low-interest loans to help youths to afford the machinery

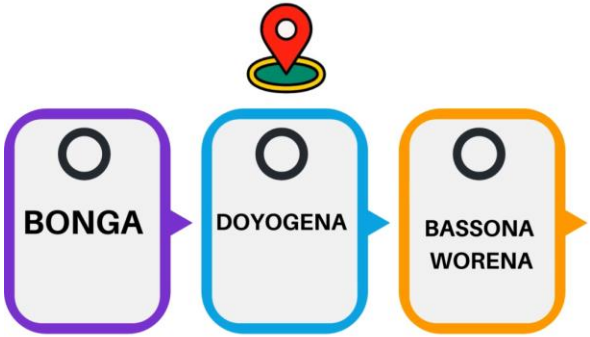
**Universities:** Practical feed processing and ration formulation learning center to students and youths

**Private:** Encouraging local manufacturing of machinery to reduce cost, designing specifically suited to the local context

## 2. Installation of feed machine at farm-level

**Assessment, developed business model and installed integrated feed processing machines in three regions of Community-Based Breeding Programs (CBBP)**



| | |
|---|---|
| **Voltage (V)** | 250v , 50Hz |
| **Driven By** | Electric Motor |
| **Production Capacity (Q/Hr.)** | 6 Qt/Hr |
| **Efficiency (%)** | 95% |

## 3. Research

- BARLY-BY PRODUCTS = 3 FEEDING TRIALS
- ROOT CROPS-BY PRODUCTS = 3 FEEDING TRIALS
- NATIVE FORAGE = 3 FEEDING TRIALS

**4. Knowledge-sharing platform** for sharing success stories, case studies, and best practices related to mechanization in feed production can facilitate knowledge exchange and inspire adoption.

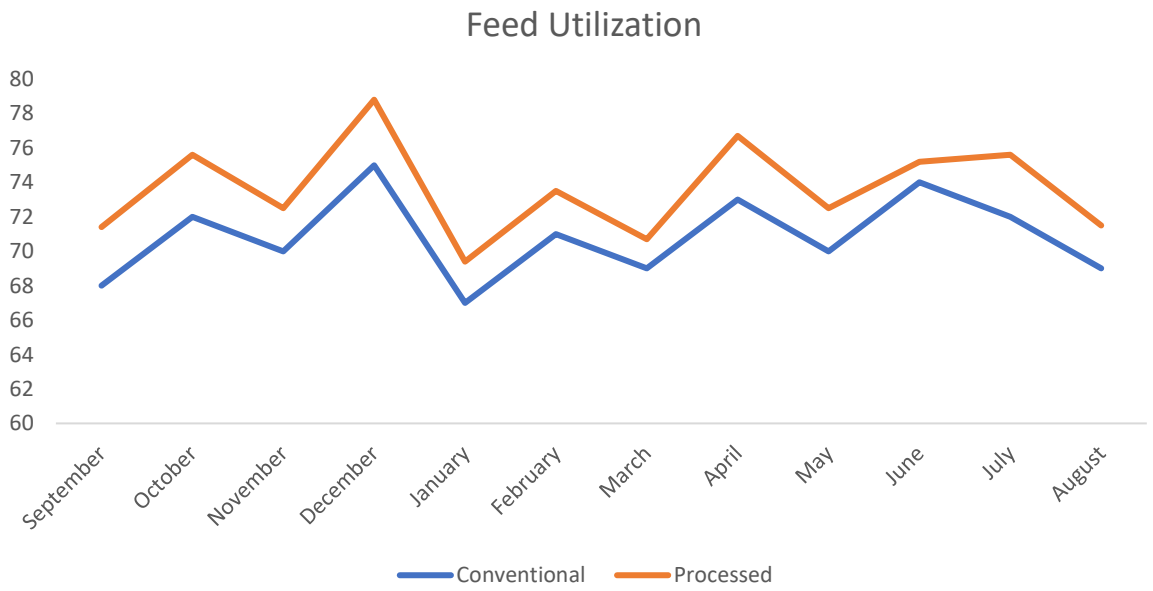
With

- Jimma University
- Wachamo University
- DB Agricultural Research Center

## 5. Preliminary Result

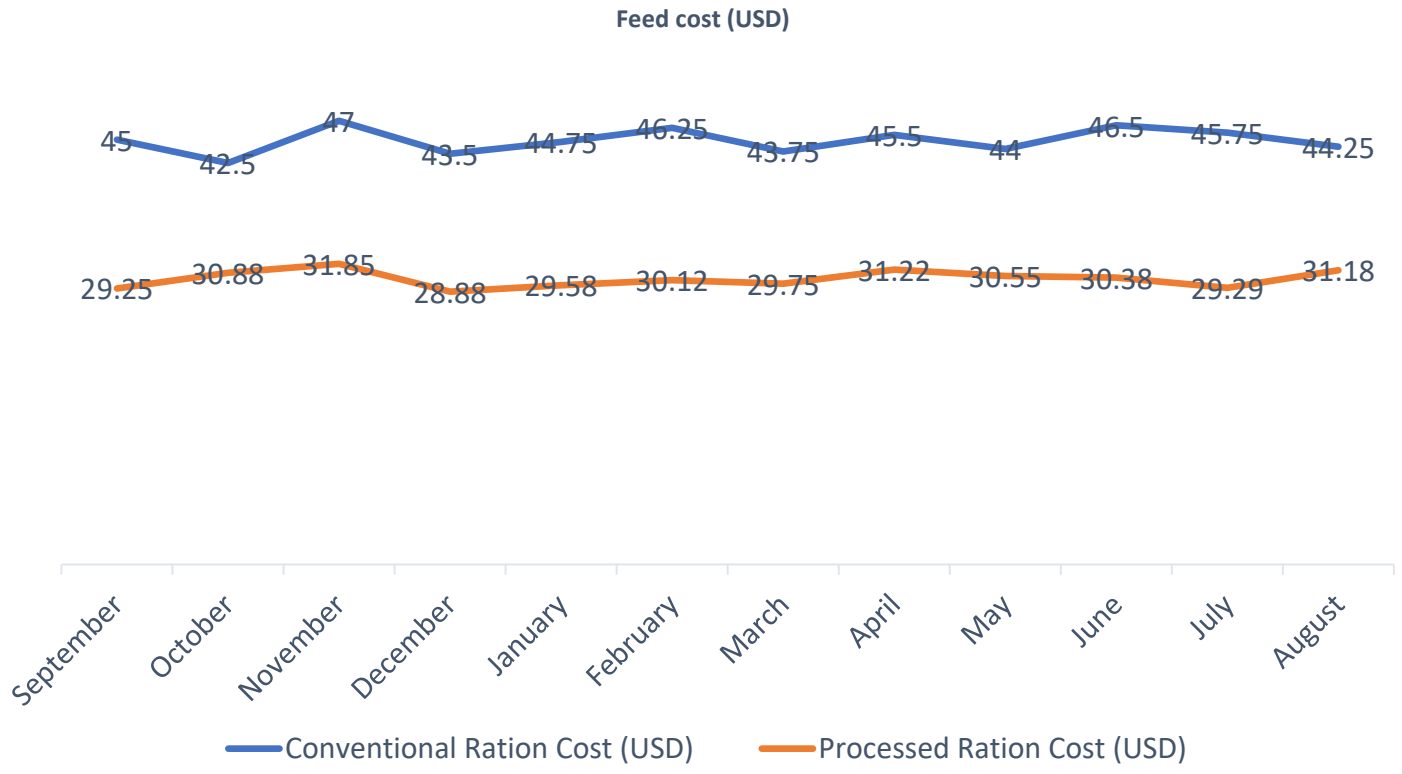
### Enhanced Feed Utilization

Enhanced feed utilization, with a 5 % increase in feed utilization compared to conventional rations of  and grain fed separately



# Cost-effectiveness

- A greater variety of byproduct feeds (food waste) can be utilized, allowing for 35% ration cost savings.



RESEARCH PROGRAM ON Livestock

CGIAR

*More meat milk and eggs by and for the poor*

# Way Forward

- **Circular bioeconomy approach:** Promote the utilization of agricultural byproducts, such as crop residues, food waste, and industrial byproducts, as feed ingredients.

- **Technology adoption:** Encourage the adoption of small-scale feed-processing machines

- **Research and innovation:** Support research and innovation initiatives focused on exploring feed ingredients, improving feed processing technologies, and optimizing feed formulations for methane reduction and improved livestock performance.

- **Capacity building and training:** empowers them to produce high-quality feed while minimising waste

- **Policy support:** Advocate for supportive policies and incentives that encourage small-scale feed mechanization


RESEARCH PROGRAM ON Livestock
CGIAR