

# Seizing the Fourth Industrial Revolution: AI, ICT & Data for Agriculture

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Tribute: to all who work/use AI, ICT and Data

# What is the Triple Engine?

## AI, ICT & Big Data Explained for Agriculture & Nutrition

### Artificial Intelligence (AI)

A super-smart assistant that learns from data. Predicts crop performance, identifies diseases, and recommends optimal practices—like 1,000 agronomists working 24/7.

### Information & Communication Technology (ICT)

Digital highways connecting researchers to farmers. Mobile apps and SMS deliver research findings directly to the field at text-message speed.

### Big Data

Massive datasets—soil, weather, yields, genetics—analyzed together to reveal invisible insights. A microscope seeing across millions of farms simultaneously.

Together, these three forces define the Fourth Industrial Revolution.

# Seize Africa's Leapfrog Moment



## First Industrial Revolution - England

Steam power, mechanization



## Second Industrial Revolution - Europe

Electrification, mass production



## Third Industrial Revolution - Asia

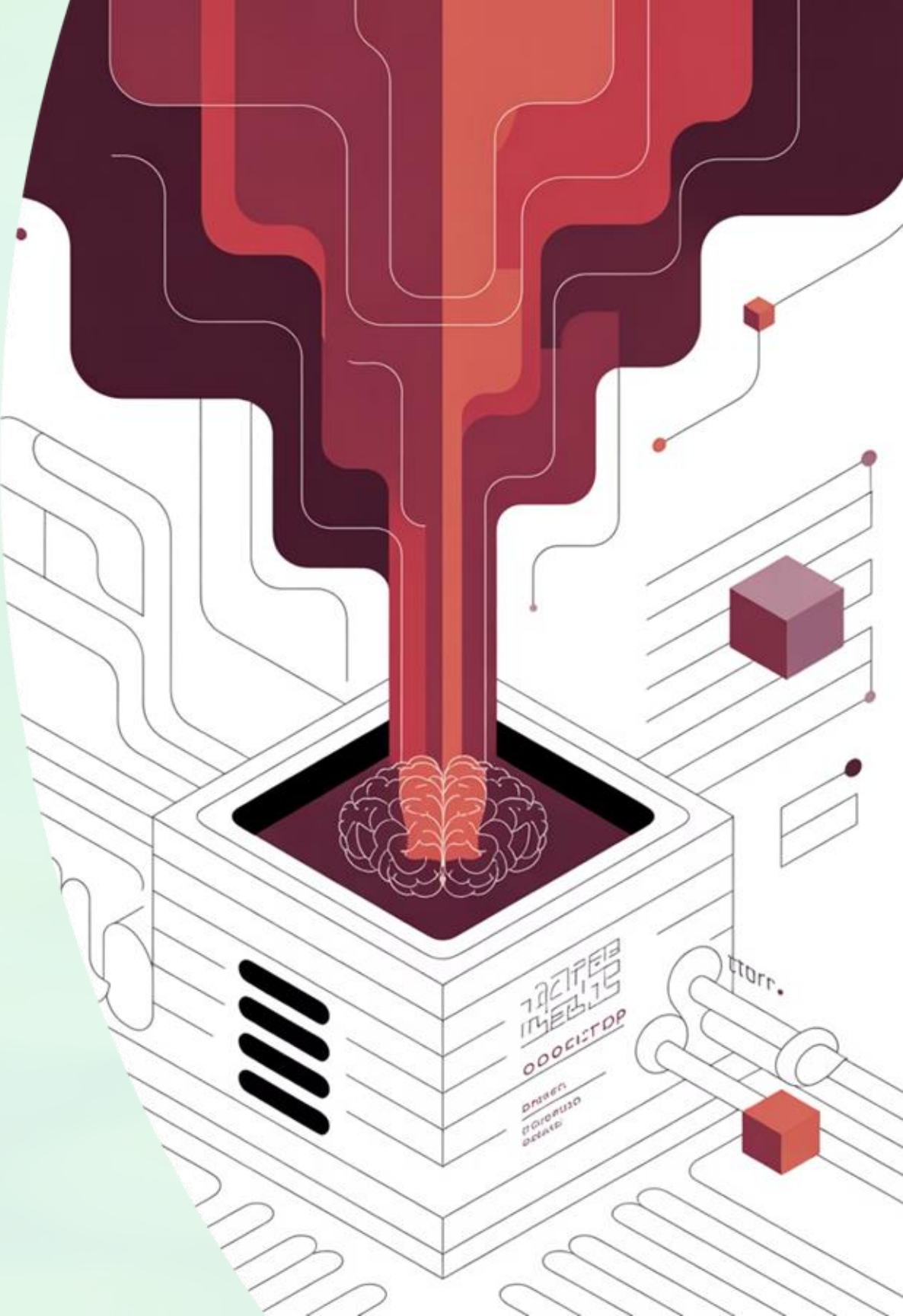
Computing, automation



## Fourth Industrial Revolution - Africa's Moment

AI, prediction, leapfrogging

This is Africa's moment to leapfrog development with AI, ICT, and Big Data.



# Biology as Digital Code

## The Pharma-Ag Blueprint

### Pharmaceutical Model

- Simulate drug interactions digitally
- Predict efficacy before clinical trials
- Reduce development time by years
- Lower costs dramatically

### Agricultural Application

- Simulate seed performance virtually
- Predict crop yields before planting
- Accelerate breeding cycles
- Optimize resource allocation

"In Pharma, we simulate drugs first. In agriculture (breeding & agronomy), we must simulate seeds before the soil."

By treating genetic information as digital code, we can apply computational methods to predict how crops will perform under different conditions—just as pharmaceutical companies model drug behavior before expensive trials.



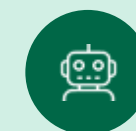
# AI Literature Mining

## Accelerating Discovery

AI transforms how we navigate the vast ocean of scientific literature, making connections humans can't.



**Scans millions of papers instantly**



**Identifies hidden patterns and gaps**



**Synthesizes decades of research**



**Delivers insights in hours**

AI reads what humans can't—at scale and speed.



# Precision Agronomy

From 'Blanket' to 'Prescription'

**What It Does:**

Site-specific data replaces one-size-fits-all advice. Sensors, satellites, and weather data guide customized recommendations for each field zone—maximizing yield while minimizing waste.

**Leading Providers:**

- Corteva Agriscience - Granular platform
- John Deere - Operations Center
- Climate FieldView (Bayer)
- Trimble Agriculture
- CNH Industrial - Raven Precision

Precision agronomy ends blanket fertilizer advice.

# Ethiopia's Moment

## The Opportunity

Rich data nourishes innovation like fertile soil nourishes crops. Ethiopia can cultivate a data ecosystem that transforms agricultural research and food security. Unlike previous industrial revolutions that required massive physical infrastructure, AI democratizes knowledge itself—accessible through mobile devices

without factories or heavy machinery.

## The Choice

The Fourth Industrial Revolution is here. Ethiopia can lead—not follow—in shaping the future of African agriculture.

AI, ICT, and Big Data offer Ethiopia an unprecedented opportunity to leapfrog traditional development. By embracing these technologies today, Ethiopia can pioneer digital agriculture and lead Africa's food future.

## The Challenge

Success requires investment in infrastructure, training, and cultural change. The rewards—food security, economic growth, and global leadership—are worth it.





# Thank You!

**Mulu Ayele, PhD, Founder**

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