ILRI | INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR

Mazingira Centre

Mazingira Centre: Evidence for livestock systems that work

Local evidence for productive, resource-efficient and environmentally sustainable livestock systems



Livestock systems across low- and middle-income countries are changing as demand for animal-source food grows amid a changing climate. How that growth happens matters. The opportunity is to produce more food from available resources while keeping environmental pressures within sustainable limits.

The Mazingira Centre generates the evidence needed to determine which approaches work under local conditions, what their wider effects are, and how change can be measured and tracked.

About the Mazingira Centre

Established by the International Livestock Research Institute (ILRI) in 2014, the Mazingira Centre was set up to generate environmental evidence from and for livestock systems in low- and middle-income countries, with a focus on greenhouse gas (GHG) emissions.

It is the only facility in Africa that brings livestock environmental measurement under one roof, with laboratories for feeds, forages, manure, biogas and soils, and chamber systems that measure GHG emissions from animals and manure.

Mazingira brings more than a decade of experience in African livestock systems, with methods and expertise that can be applied across diverse livestock production systems in low- and middle-income countries.

Its strength is connecting rigorous experimental measurement with real-world livestock systems—from the animal, feed, manure and biogas, and soil to the farm, landscapes and national reporting and investment.

Mazingira's core capabilities include:

- livestock methane measurement using controlled chambers, field methods for grazing animals, and drone-based approaches;
- methane and nitrous oxide measurement across manure and soils;
- GHG, feed, forage, manure, soil and nutrient laboratory analysis;
- soil organic carbon measurement and mapping in crop–livestock and grazing lands;
- manure management, biogas, bio-slurry, and circular use of nutrients;
- on-farm environmental measurement across livestock production systems;
- landscape-scale carbon and GHG monitoring using flux towers that measure exchanges of carbon, water and energy, across contrasting land uses;
- development and testing of fit-for-purpose and digital measurement, reporting, and verification (MRV) systems for national GHG inventory, national determined contributions (NDC) tracking and climate finance.

Why it matters

Livestock contributes to the livelihood of about 1.7 billion people worldwide, and demand for animal-source foods is set to rise. The largest absolute increases are expected in East and Southeast Asia, but the fastest growth is in Africa, where meat demand is projected to triple and milk demand to double between 2015 and 2050.
That growth comes as climate change makes livestock harder to keep.

Heat stress, drought and reduced availability of feed and water are already affecting production, so farmers will need to produce more under tougher conditions.

How they do that will differ from place to place. There is no single livestock system: pastoral herds, smallholder dairies and more intensive farms work under very different conditions, so solutions have to fit the system they are meant for.

The question is not whether livestock systems will change, but how.

Can the world meet growing demand for animal-source food while supporting livelihoods, using feed, land and nutrients more efficiently and keeping environmental pressures within sustainable limits?

Mazingira therefore asks not only "does it work?" but "does it work in this system, with what benefits and with what trade-offs?"

How Mazingira works



1. Measure

Generate evidence on animals, feed, manure, biogas, soils and landscapes through controlled experiments, laboratory analysis and field measurements.



2. Establish what works

Test promising solutions under controlled conditions and determine whether they work in real production systems.



3. Compare future pathways

Combine measurements with livestock and environmental models to compare intervention packages and future pathways.



4. Understand the system

Assess productivity, resource use and environmental effects together. The aim is to identify benefits and avoid unintended trade-offs.



5. Track change and inform decisions

Develop baselines, indicators, emission factors and practical MRV approaches to strengthen national reporting, track mitigation actions and inform investment and climate finance decisions.



6. Build capability

Embed students, researchers and technicians in projects for hands-on training in measurement, analysis and MRV, strengthening individual skills and institutional capability with project partners.



Breath-capturing harness

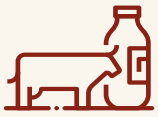


Biodigester

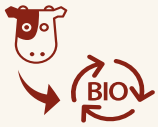


Eddy covariance tower

What this is designed to deliver



More productive livestock systems



Smarter resource use



Environmental sustainability

From evidence to MRV

Mazingira turns measurement into practical approaches for tracking change at three levels:



Projects and programs

Establish baselines and track outcomes.



National GHG inventories

Generate locally relevant livestock data and emission estimates.

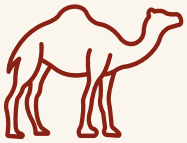


NDCs and climate finance

Support credible reporting of mitigation actions.

The goal is not simply a more precise emissions number.
It is the ability to measure meaningful change, track it over time, and present it credibly.

Key achievements



Adapting methane measurement for local contexts

Mazingira has adapted field methods to measure methane for grazing cattle and camels and pioneered drone-based methane measurements, expanding the ability to measure emissions under real production conditions.



Generating evidence for circular biogas systems

Mazingira evaluated biodigester performance, GHG benefits, bio-slurry use and adoption in Kenya, generating evidence relevant to the African Biodigester Component program.



Putting African drylands into global datasets

Long-term eddy-covariance measurements from Kapiti (KE-Kpt) and Ausquest (KE-Aq1 & KE-Aq2) contribute African rangeland and dryland-cropping data to global FLUXNET network.



Informing GHG reporting from global to national levels

Mazingira research contributed African livestock data to the guidelines used to calculate national GHG emissions and has supported Kenya's move toward higher-tier GHG reporting.



Informing low-emission and sustainable livestock pathways

Mazingira researchers contributed analysis on low-emission and sustainable livestock pathways to the World Bank's 2026 regional synthesis for East Asia and the Pacific.



Informing parliamentary climate action

Mazingira livestock evidence contributed to a 2026 regional parliamentary seminar whose report and 11 methane-action recommendations were adopted by Kenya's National Assembly.

58 researchers, fellows & trainees

Hosted between 2024 and 2026 from 22 countries, including 45 people from 9 African countries.

Work with Mazingira

Fund

Invest in independent evidence, long-term scientific capability, and livestock–environment research that can guide decisions.

Implement

Build measurement and learning into your delivery programs, so that what you implement today informs what you invest in next.

Learn and innovate

Co-develop, test, and adapt promising technologies, methods, and approaches in Africa's diverse livestock systems.

Mazingira is where promising livestock solutions meet real-world conditions.

Measure what matters. Establish what works. Track what changes.

Contact

Email:
Info.Mazingira@cgiar.org

Website:
www.ilri.org/research/facilities/mazingira-centre

Download the brochure



ILRI

Better lives, better planet through livestock

The International Livestock Research Institute (ILRI) is a non-profit institution helping people in low- and middle-in-come countries to improve their lives, livelihoods and lands through the animals that remain the backbone of small-scale agriculture and enterprise across the developing world. ILRI belongs to CGIAR, a global research for development partnership working for a food-secure future. ILRI's funders through the CGIAR Trust Fund, and its many partners, make ILRI's work possible and its mission a reality. Australian animal scientist and Nobel Laureate Peter Doherty serves as ILRI's patron. You are free to use and share this material under the Creative Commons Attribution 4.0 International Licence.