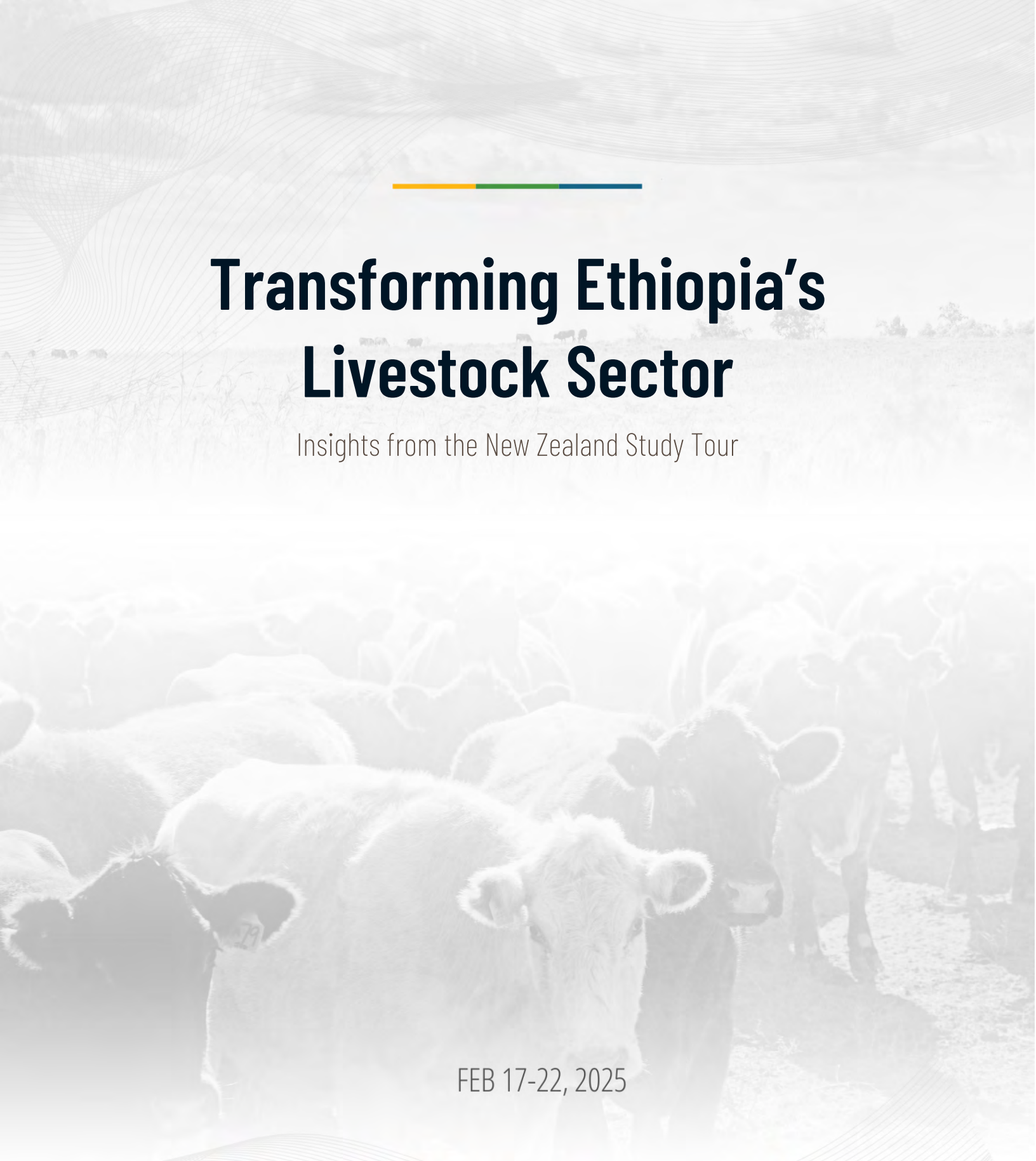
Transforming Ethiopia's Livestock Sector

Insights from the New Zealand Study Tour



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Executive Summary

Ethiopia has the largest livestock population in Africa, contributing to around 40% of Ethiopia's agricultural gross domestic product (GDP), nearly 20% of its total GDP, and 20% of its national foreign exchange earnings. However, the sector remains far from reaching its full potential. Productivity is low, export market access is limited, and critical data systems are fragmented and inconsistent. Due to these challenges, Ethiopia is missing the opportunity to turn the livestock sector into a pillar of growth, foreign investment, and food security.

In response to these challenges, Ethiopia has initiated programs such as Yelemat Tirufat ("Bounty of the Basket"), which aims to transform dairy, poultry, and apiculture sectors by improving productivity, creating jobs, and promoting food self-sufficiency. However, achieving these outcomes requires coordinated action in several areas, most notably in digital transformation, breeding and genetics, institutional alignment, and human capital development.

To share experience from one of the leading livestock producers globally, a delegation of Ethiopian officials participated in a livestock study tour to New Zealand, organized by the Livestock Improvement Corporation and Development Gateway: An IREX Venture under a Livestock Information Vision for Ethiopia (aLIVE) program. New Zealand was selected for its globally recognized livestock sector where data, technology, and institutional coordination drive productivity, traceability, and market competitiveness. The tour offered firsthand insights into how a country, with no more than 10 million cattle, can build a globally competitive livestock system grounded in real-time data and farmer participation.

Ethiopia's delegation visited leading farms, abattoir, research institutions, cooperatives, and regulatory bodies. The tour highlighted how a properly collected, integrated, and used livestock data support decisions from the farm to the national policy level.

01

Introduction

Purpose of this brief

This policy brief captures key lessons from the New Zealand livestock study tour and outlines their relevance for Ethiopia. It is intended to guide policymakers, system managers, and development partners in strengthening Ethiopia's livestock systems through strategic reforms and targeted investments. The brief highlights examples of what is possible when data, institutions, and producers all work together for a shared vision while emphasizing the ongoing efforts under the aLIVE program.

Purpose and rationale of study tour

The study tour aimed to expose the Ethiopian delegation to successful approaches in livestock sector modernization through digital tools, institutional alignment, and data driven policy. New Zealand was chosen because it is globally recognized for its performance in dairy and livestock sectors. The country's success lies in its integrated systems, strong cooperative model, and the use of digital tools to support herd management, breeding, and export certification. Participants visited farms, abattoir, cooperatives, regulatory bodies, and technology platforms to observe how data is used across the value chain.

The key purposes of the tour were to:

- Gain insights into data management and utilization in the livestock value chain by visiting leading farms, research institutions, and agricultural technology companies in New Zealand
- Observe firsthand how data is collected, analyzed, and applied in decision–making processes to improve productivity, efficiency, and sustainability
- Exchange ideas and best practices with New Zealand counterparts, fostering cross–cultural collaboration and learning opportunities
- Understand the role of data–driven systems in shaping policies and planning decisions, with insights from the key stakeholders in the New Zealand agriculture sector
- Empower attendees with the knowledge and first–hand experience needed to harness the power of data within project aLIVE

Ethiopia can leverage these insights by tailoring them to local conditions and implementing scalable, cost-effective strategies. Importantly, this tour offered the delegation a chance to see firsthand that it is possible for a country to significantly support their economy through the agricultural sector. This provides strong evidence that can be taken back to higher level decision makers in Ethiopia and leveraged in support of implementing these new strategies in support of livestock.

Ethiopia's Livestock Sector: Current Status and Challenges

Ethiopia has the largest livestock population in Africa, contributing to around 40% of Ethiopia's agricultural gross domestic product (GDP), nearly 20% of its total GDP, and 20% of its national foreign exchange earnings.1 Despite this, the sector's potential remains underutilized due to challenges such as limited access to technology, inadequate infrastructure, and weak market linkages.

One of the key challenges is the fragmentation and underdevelopment of livestock data systems, which limits the Ministry's ability to plan, monitor, and respond effectively across the value chain. Without accurate, timely and reliable data, the government cannot respond quickly to disease outbreaks, ensure compliance with export standards, or improve productivity through informed breeding and genetics, costing Ethiopia in both foreign exchange as well as farmers income, further affecting their livelihood.

- Population data remains unreliable, with surveys relying on inconsistent census methods and outdated figures. Pastoralist areas are especially underrepresented, and livestock counts are rarely updated in real time
- Genetics data is poorly managed, with no centralized platform to track breed performance or inform breeding strategies
- Health data is fragmented and reactive, often collected manually and siloed across regions and institutions
- Production data is inconsistently recorded, lacking standardization or real–time visibility. Milk, meat, and feed data are collected by different entities without integration, making it difficult to assess productivity trends

At the core of these challenges is a lack of integration. Unlike New Zealand, Ethiopia's data systems remain fragmented, underfunded, and largely paper-based. However,

1 Feed the Future Innovation Lab for Livestock Systems. (2021). Ethiopia's Livestock Systems: Overview and Areas of Inquiry. The U.S. Agency for International Development. https://livestocklab.ifas.ufl.edu/media/livestocklabifasufledu/pdf-/LSIL_Livestock_Systems_ Overview_Ethiopia_2021_08.pdf

there are promising initiatives underway. The aLIVE program is already investing in the development of an integrated and interoperable Livestock Information System (LIS) backed by robust data governance platform and common data standard, which aims to integrate traceability (LITS), animal health (ADNIS, DOVAR), production, market (LMIS), and genetic databases.

New Zealand's livestock sector - a model of success

In contrast, New Zealand has transformed its livestock sector into a significant economic driver. The dairy industry contributes approximately 3.2% of the country's total GDP and accounts for around 35% of New Zealand's total commodity export value.2 The red meat industry alone contributes nearly NZD 12 billion (USD 7.1 billion) in industry value added, supports over 92,000 jobs (4.7% of national employment),3 and accounts for 16.2% of the country's total exports.4 This success is attributed to robust biosecurity systems, integrated data platforms like the National Animal Identification and Tracing (NAIT) system, and strong public-private partnerships.

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Driving production and productivity through technology: Lessons from New Zealand

The New Zealand study tour provided valuable insights that the Ethiopian livestock sector can potentially adopt, particularly in the use of digital tools and precision farming technologies to enhance production and productivity.

Farmers in New Zealand use digital tools for herd monitoring, feed optimization, and disease prevention. Implementation of automated milking systems improves efficiency and reduces labor costs. Automation, such as robotic milking systems, automated feeding, and heat detection technologies, are becoming more common on larger farms to improve efficiency.

Efficient pasture management and rotational grazing systems are used to maximize milk yield and land use. Farms have adopted climate smart practices, including water conservation and emissions reduction, and the pasture based farming system prioritizes animal welfare.

Farmers actively participate in genetic selection programs, which improve milk yield, disease resistance, and animal resilience. Farmers are highly aware of what they are doing, what is happening higher up, and how data benefits them. Farmers leverage real-time data for precise herd management, improving decision-making and efficiency. These benefits serve as a driving force for farmers to feed data into platforms like MINDA in a timely and consistent fashion.

New Zealand has built an efficient and productive livestock sector through advanced breeding programs, genetic improvement, and the use of modern reproductive technologies. Tools like artificial insemination (AI) and embryo transfer enable faster genetic progress, while genomic research supports the identification of traits linked to milk production, disease resistance, and climate adaptability. Farmers use platforms like LIC's MINDA and GeneMark to guide mating decisions based on performance and breeding value. The Breeding Worth (BW) index and Ranking of Active Sires (RAS) are also used to select top performing bulls, which boosts productivity across the national herd.

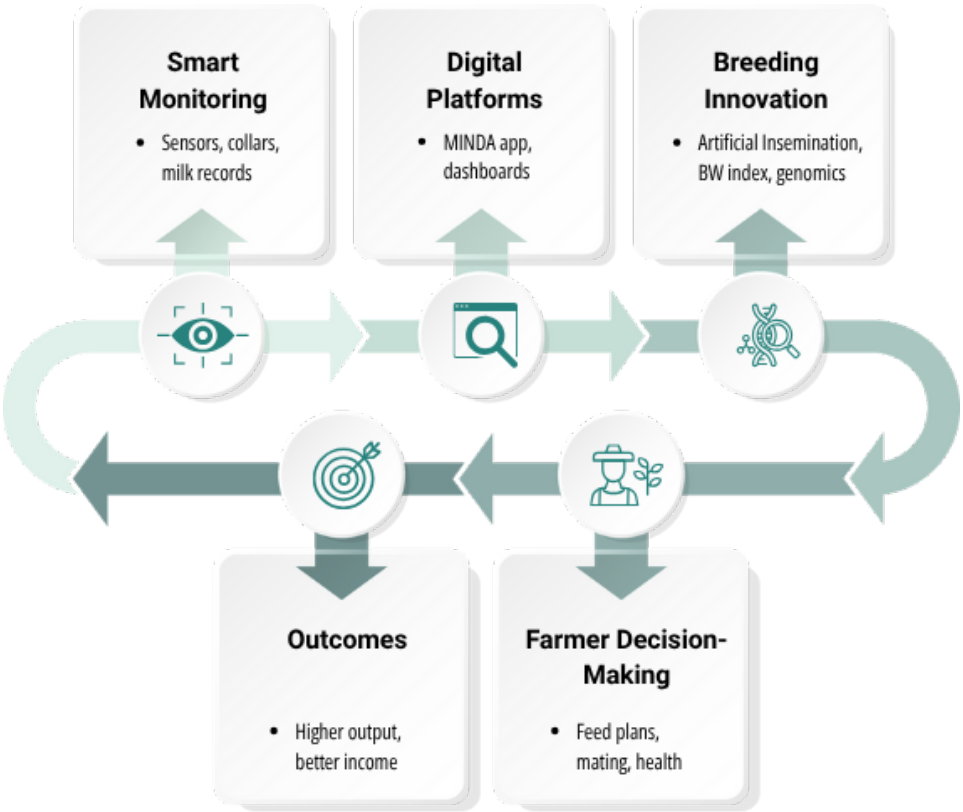
User friendly mobile data entry creates ease for farmers and removes barriers. Farmers enter data into the National Animal Identification and Tracing (NAIT) system, which provides full traceability for livestock, ensuring disease control and market credibility. RFID ear tags are used to track health, breeding, and movement history.

Relevance and opportunity for Ethiopia

Ethiopia could significantly enhance livestock productivity by adopting low-cost, scalable technologies adapted from the New Zealand model. Several immediate opportunities exist:

- Implement and deploy online/offline compatible LITS mobile apps for animal tracking, developed under Ethiopia's existing aLIVE program.
- Pilot RFID ear tags in commercial dairy and beef farms to support individual animal monitoring, health traceability, and disease control—possibly in partnership with Ethio Telecom for data integration.
- Introduce affordable, solar–powered semi–automated milking machines and smart feeders, particularly in urban and peri–urban dairy producers and remote areas.
- Adopt rotational grazing practices and precision pasture monitoring to improve land use efficiency and prevent overgrazing.
- Utilize drones for herd monitoring in pastoralist areas to reduce livestock loss, support movement tracking, and improve resource allocation.
- Strengthen AI breeding programs and national genetic databases to enable selection of high–performing, climate–resilient animals, inspired by New Zealand's use of Breeding Worth (BW) indices and genomics.

Digital technology supported livestock productivity loop



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Building competitive and traceable livestock market

New Zealand's livestock sector is globally recognized for its robust traceability systems, export ready certification processes, and value added production chains. By assuring food safety and traceability, New Zealand is able to command higher prices for its livestock exports contributing to the country's revenue. During the study tour, participants observed how the country has built a livestock market that is not only highly efficient but also transparent, trusted, and driven by strong cooperative models.

The National Animal Identification and Tracing (NAIT) system is central to this success. Farmers are required to enter data at every stage of the animal's life, from birth through to slaughter or export. This system ensures that each product can be traced back to its origin, with the main aim of disease control, marketing, and compliance with international health and food safety standards. Participants observed how livestock are tagged using RFID ear tags, and how these are used throughout the meat and dairy supply chains to monitor health history, movement, and certification.

During the abattoir visit, it was clear that traceability was enforced at every point of the process. Meat products are tracked from the abattoir (even after slaughtered & packed), back to the farm of their origin, with clear labeling and verification protocols. Strict regulations are overseen by government veterinarians to ensure humane slaughter, biosecurity compliance, food safety, and hygiene standards that meet the expectations of premium export markets. These standards are tied directly to economic incentives for farmers, processors, and exporters.

Beyond traceability, cooperative processing and value addition were key lessons. Farmers in New Zealand are not just producers but also are stakeholders in cooperatives like Fonterra and DairyNZ, which process and market dairy products globally. By investing in fixed capital like milk processing plants, solar dryers, or chilling centers, farmers move beyond raw product sales into branded, higher-value markets. This model ensures fair pricing, stronger bargaining power, and sustainable market integration.

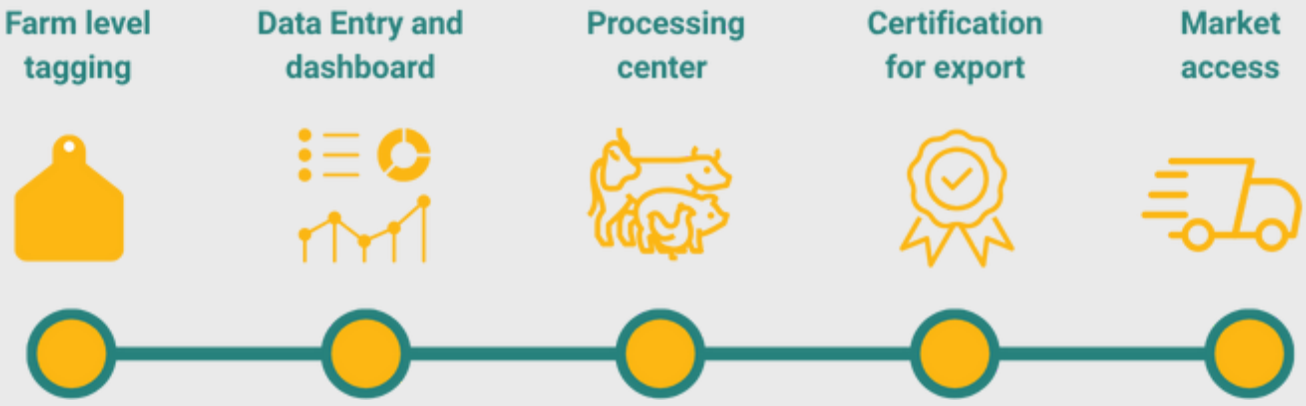
These cooperative and regulatory systems work together to ensure that livestock products meet the expectations of international buyers, from hygiene to labeling, strengthening Ethiopia's case for accessing premium markets.

Relevance and opportunity for Ethiopia

Ethiopia has a major opportunity to build a competitive and transparent livestock market by adapting lessons from New Zealand's traceability and value chain systems.

- Strengthen the LITS platform to ensure real time livestock traceability, starting with commercial farms and export oriented producers and later expand it across the entire livestock producers
- Implement data entry at key points in the value chain, from animal tagging through slaughter, to establish reliable disease tracking and certification. This can be done through strengthening the LITS mobile–app developed by aLIVE to support data capture across the entire value chain
- Pilot RFID ear tags and digital animal records that integrate with mobile data collection and export systems
- Strengthen abattoirs and processing facilities through better hygiene, enforcement of humane handling standards, and digital tracking of product origin and quality
- Invest in cooperative led processing infrastructure (e.g., milk chilling centers, solar dryers) to help farmers shift from raw to value–added products
- Develop a "Certified Ethiopian Premium Meat" or "Grass–Fed Livestock" brand, modeled after New Zealand's export marketing strategies, supported by robust data and traceability

Traceability and Value Chain Integration in Livestock Market



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Institutional alignment and partnership with private sector

A key lesson from New Zealand's livestock sector is the importance of clearly defined roles and strong coordination among government, private sector actors, cooperatives, and research institutions. This alignment enables consistent policy implementation, efficient service delivery, and innovation at scale.

The Ministry for Primary Industries (MPI) is New Zealand's lead organization for livestock regulation, focusing on food safety, animal welfare, biosecurity, and international trade standards.The important difference with MoA is that MPI does not deliver services directly. Instead, it enables and oversees a system in which farmer cooperatives and the private sector are responsible for implementation. This separation of roles allows the government to focus on regulation and market access, while service providers focus on delivery and innovation.

New Zealand's regulatory framework is also supported by strict biosecurity laws and enforcement mechanisms, coordinated through MPI. These measures protect the national herd from foreign disease, ensure traceability, and support market access. The government carries out active and passive disease surveillance, airport inspections, and mandates animal identification as part of its broader biosecurity strategy. This integrated approach enables rapid disease response and underpins New Zealand's global reputation for safe, high-quality livestock products.

Private cooperatives such as LIC, Fonterra, and DairyNZ play central roles in genetic improvement, data collection, disease monitoring, product processing, and export certification. These organizations are farmer owned and operated. Farmers are shareholders, not just clients, which plays an important role in creating trust and accountability.

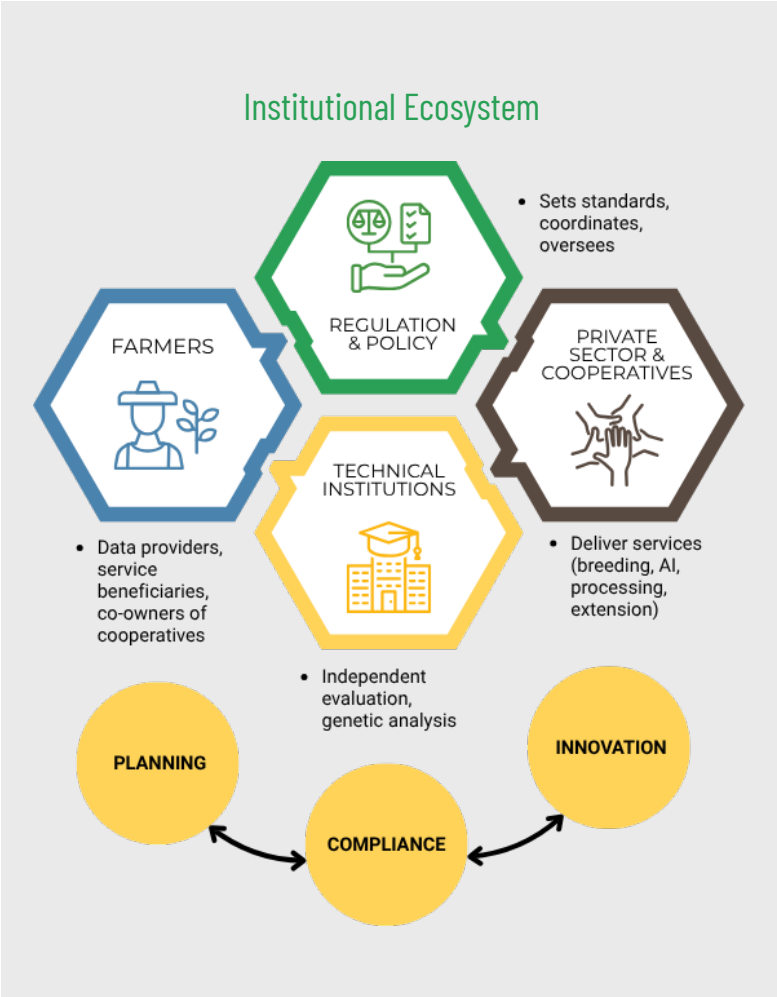
Coordination between MPI and these institutions is mutually strong and ongoing. For example, MPI collaborates with LIC and DairyNZ on biosecurity surveillance, data governance, and policy development. Multi stakeholder advisory platforms and joint research programs ensure alignment between what the government goals are and industry realities on the ground. The public sector sets standards; the private sector executes, informs, and evolves them further.

The system is further strengthened by independent entities like NZAEL (New Zealand Animal Evaluation Limited), which ensures transparency and objectivity in genetic evaluations. This model of distributed leadership and mutual accountability has helped New Zealand achieve high levels of productivity, compliance, and market reputation.

Relevance and opportunity for Ethiopia

Ethiopia's livestock sector currently suffers from fragmented institutional mandates, weak public-private coordination, and limited capacity among cooperatives. The New Zealand model offers several actionable lessons:

- Clarify institutional roles by separating regulatory oversight (e.g., food safety, traceability, disease surveillance) from service delivery
- Strengthen and professionalize cooperatives, enabling them to deliver breeding, artificial insemination (AI), extension, and processing services
- Encourage private–sector innovation in animal health, traceability, and digital tools, supported by enabling regulations and shared data platforms such as the the National Livestock and Fisheries Extension Strategy and Roadmap, which promotes private–sector engagement in veterinary services and technology adoption; the Digital Ethiopia 2025 Strategy, which advances digital transformation in agriculture, including mobile–based animal health systems; and the Public–Private Partnership Framework led by the Ministry of Finance, which enables private–sector roles in vaccine supply, disease control, and service delivery.



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Farmer participation and buy-in

One of the most important features of New Zealand's livestock sector is the strong role played by farmers. Farmers are not just producers, but are active participants in data systems, breeding programs, cooperative governance, and on-farm decision-making. This high level of participation drives trust, accountability, and sustained use of livestock information systems across the country.

Farmers are the first point of data entry. They record events like births, pregnancies, health treatments, and production outcomes using mobile and web-based platforms such as MINDA. These systems are designed to be simple and practical, with offline functionality and interfaces that reflect everyday farm workflows. Because data begins at the farm, it is timely, reliable, and relevant, ensuring its value at both the operational and national levels.

Another very important learning is that farmers are also the main end users of their own data. Through dashboards and alerts, they track herd performance, plan breeding schedules, and make decisions on feed and health interventions. This creates a powerful feedback loop where farmers who see value in the data are more likely to keep contributing to the system. The data benefits them directly.

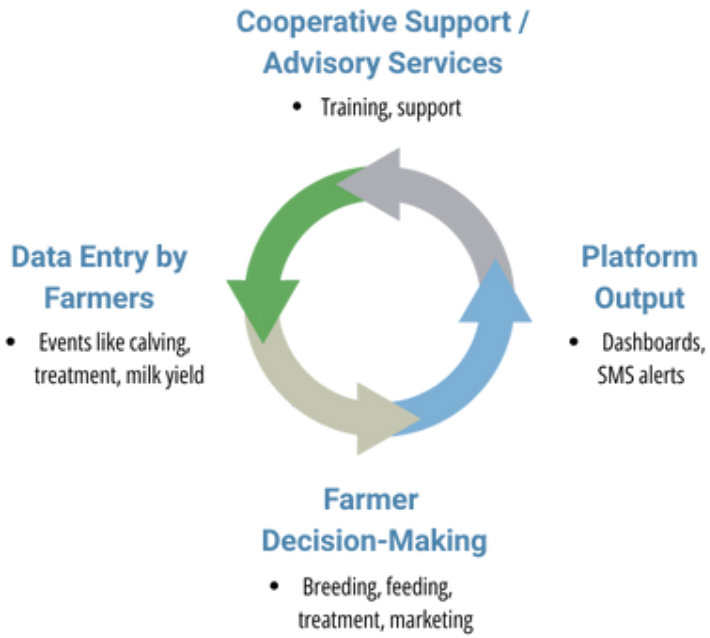
In addition to digital tools, cooperatives and advisory systems play a key role. LIC and DairyNZ provide training and support to help farmers understand their data, navigate the tools, and adopt improved practices. These organizations also aggregate farm level data to deliver services like breeding recommendations, diagnostic testing, and benchmarking.

Farmer ownership is a common part of institutional structures. Most service providers whether breeding programs or processors are farmer owned, meaning farmers influence strategic direction and benefit from system improvements. This sense of shared purpose and visibility across the value chain is a major factor behind New Zealand's high compliance and data quality.

Relevance and opportunity for Ethiopia

Increasing farmer participation is critical to the long-term success of Ethiopia's livestock information systems. Several lessons from New Zealand can be adapted to Ethiopia's context:

- Design data tools that start at the farm or livestock producers, allowing farmers to input events (e.g., birth, treatment, milk yield) using offline–friendly apps
- Create feedback loops by providing farmers with easy–to–understand dashboards, summaries, or SMS–based alerts that show the value of the data they enter
- Train farmers and cooperatives on digital tools and on how to interpret data for breeding, feeding, and marketing decisions
- Build farmer trust and ownership by ensuring their data is used to inform policies and market access, not just regulatory reporting



06

Use of data for policy, planning and sustainability

In New Zealand, data is key for decision making across the entire livestock value chain from genetic improvement to on-farm practices to trade, certification as well as policy formulation. The various data systems observed during the study tour demonstrate how consistent, real time and farmer led data is used to transform and direct actionable plans at every level.

At the farm level, data is captured directly by farmers through tools like MINDA, covering key events such as calving, health treatments, milk production, and breeding. This data is then aggregated by cooperatives like LIC and DairyNZ, who use it to provide tailored advice and performance benchmarks to farmers.These same records also feed into national systems like NAIT and DIGAD, enabling real-time tracking, genetic evaluation, and sector-wide planning.

At the institutional level, the Ministry for Primary Industries (MPI) uses data from across the system to guide regulation, monitor biosecurity risks, and manage disease outbreaks. The M. Bovis eradication effort was cited as a prime example: data from traceability systems allowed authorities to isolate and address the outbreak quickly, demonstrating how integrated data systems can directly inform disease control strategies. This reflects how biosecurity is treated as a national priority. Data from NAIT and other systems provide real-time visibility on animal movements and health events, enabling swift response to outbreaks and widespread diseases.

Data also supports long-term policy and investment planning. Aggregated statistics help determine breeding priorities, target R&D funding, and ensure that food safety and sustainability regulations are grounded in real conditions. These systems are backed by national standards for data quality and interoperability, ensuring consistency across platforms.

The power of this system lies not just in technology, but in its design: data flows both upward and downward, from farmer to ministry and back, ensuring that farmers benefit from the same information used by regulators, researchers, and markets.

Relevance and opportunity for Ethiopia

Ethiopia's livestock sector has historically struggled with fragmented data systems, poor real-time monitoring, and limited use of information in planning or policy. Lessons from New Zealand point to a more integrated and actionable approach to livestock data where much of which is already being initiated under the aLIVE program:

- Implement national data standards and interoperability protocols, building on the 2024 data standard introduced by the aLIVE program to ensure consistency across systems.
- Leverage the Livestock Information System (LIS) currently being developed under aLIVE to integrate data from LITS, LMIS, ADNIS, DOVAR, and genetics platform to create an integrated, interoperable system that supports planning and policy across production, health, genetics, and trade
- Use data for early warning systems, supporting drought mitigation, disease control, and water access especially in pastoral regions, where the LIS could interface with remote sensing and other reporting systems
- Deploy dashboards and analytics tools for policymakers, a core function of the LIS platform under development, enabling real–time tracking of vaccination, artificial insemination, disease outbreaks, and production trends
- Expand tools for farmer feedback, including the LITS mobile app and improved rollout of the LMIS SMS platform, to ensure that farmers can access summaries, alerts, and data–based recommendations in their local languages even in low internet connectivity areas

This experience shows that integrating data and digital tools is not just a technical endeavor but a cross-cutting enabler that connects farmers, service providers, regulators, and markets for improved coordination, planning and decision making.

07

Cross-cutting: integrating data and technology across Ethiopia's livestock system

A key insight from the New Zealand study tour is that data and technology are most effective when they are integrated across institutions, service providers, and users. In New Zealand, systems like MINDA, NAIT, and DIGAD work together to support farmers, regulators, and policymakers with timely and consistent information. This integration improves service delivery, enables rapid disease response, and supports policy decisions with real-time evidence.

In Ethiopia, efforts are already underway to move in this direction. The aLIVE program is supporting the development of a national Livestock Information System (LIS) that brings together key data systems including LITS for traceability, ADNIS/DOVAR for animal health reporting and surveillance, and LMIS for market data and Genetics Database for livestock development. The goal is to create a single, interoperable platform that supports decision-making at all levels.

This work is still in progress, but promising foundations are in place:

- The LIS dashboard is under development to support real–time monitoring and planning by government agencies
- A mobile app for LITS has been designed with offline functionality and is being tested in selected areas
- Existing tools like the LMIS SMS platform can be repurposed as early examples of how farmers could receive useful summaries or alerts from the system.

MoA's success will depend on making these tools work together. Ensuring data is consistent, shared across institutions, and used by those making decisions for policy or on the ground is key.

08

Strategic recommendations and way forward

The following priority actions are recommended to strengthen Ethiopia's livestock sector, drawing on lessons from the New Zealand study tour and current efforts under the aLIVE program:

- Define and separate institutional roles: establish a clear distinction between regulatory functions (e.g., food safety, disease control) and service delivery. Create a coordination mechanism across MoA, Ethiopian Agricultural Authority (EAA), ESS, LDI, cooperatives, and private sector . The Ministry of Agriculture should focus on high–level governance, policy, regulation, and coordination. Operational service delivery, extension, and innovation should be increasingly led by farmer organizations, cooperatives, and private actors.
- Strengthen cooperative and private sector engagement by establishing farmer–led cooperatives and positioning farmers as active partners, supporting digital tools and innovations, enabling environments in service delivery and promoting public–private partnerships
- Establish the Livestock Information System (LIS) nationwide: finalize the LIS platform and ensure it integrates LITS, ADNIS/DOVAR, LMIS, and genetics systems. Establish clear ownership, governance, and sustainability mechanisms
- Upgrade livestock traceability systems: strengthen the LITS platform and pilot RFID–based animal identification in commercial farms first and individual farms at a later stage. Link slaughterhouse data and export certification to the system
- Scale up mobile and offline tools for farmer–led data collection and reporting: expand use of the LITS mobile app to allow farmers to submit and receive data. Localize interfaces and build feedback features
- Embed data in routine policy and planning cycles: require use of LIS data for planning, reporting, and budgeting at federal and regional levels. Include data indicators in livestock sector performance reviews
- Expand genetic improvement programs: formulate a national livestock breeding strategy that prioritizes high–impact traits, strengths AI services and implements open sire evaluation systems. In addition, scale up artificial insemination and strengthen national genetic data systems should be implemented

- Develop and enforce national animal welfare standards linked to market access, supported by farmer training and incentives.
- Design a national livestock biosecurity system covering farm–level prevention, border controls, and rapid response, integrated with animal ID and traceability systems
- Strengthen export and market access by establishing and supporting exporters to meet export–grade standards, promoting value addition, investing in infrastructure and facilitating digital trading platforms.
- Establish a national livestock certification brand: develop and promote a "Certified Ethiopian Premium Meat" or "Grass–Fed Livestock" brand tied to traceability, animal welfare, and food safety standards.
- Develop/reform land use policies that guide dairy land allocation, set environmental limits, encourage land–use zoning and ensure land tenure security for livestock keepers.
- Build the capacity of livestock cooperatives and farmers: train and equip cooperatives and farmers to deliver AI services, extension, and small scale processing. Link them to markets and integrate them into digital platforms (data collection, data use for decision making etc).
- Introduce cost–effective automation for production: support cooperatives and farms to adopt semi–automated milking machines, feeders, and solar powered equipment to improve productivity

Suggested side boxes

Box 1: aLIVE's contribution so far

- The aLIVE program is laying the groundwork for digital transformation in Ethiopia's livestock sector. Its key contributions include:
- Development of the national Livestock Information System (LIS) integrating traceability, health, genetics, and market data
- Creation of the LITS mobile app (offline compatible) for field level animal registration and tracking
- Establishment of the National Livestock Data Standard to ensure system interoperability
- Support for institutional coordination and planning across MoA, LDI, MoTRI, ESS and development partners

Box 2: New Zealand Model - why it works

New Zealand's livestock sector success has these main features

- Separation of roles: role of government is regulation, the private sector and cooperatives are deliver services, drive innovation and R&D
- Farmer led cooperatives farmers as shareholders
- Data use for decision making – platforms like MINDA and NAIT drive real–time insights
- Enforced traceability and biosecurity – strong emphasis on traceability and biosecurity ensure market credibility and rapid outbreak response