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Unlocking Agricultural Finance through Data Governance Reform:

Building Ethiopia's Agri-Stack for Inclusive Growth and Digital Sovereignty

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Executive Summary

Ethiopia's agricultural sector remains the backbone of the economy, contributing over 30% of GDP and employing around 65% of the workforce, yet it faces a persistent financing shortfall.[1] The constraint goes beyond just the shortage of capital. A major constraint to accessing finance is the absence of verified, structured, and interoperable data that would enable financial institutions to lend confidently and design risk-based financial products. Ethiopia's agricultural financing gap is estimated at 2.5 trillion Birr annually, with financial institutions meeting only about 2% of this need.

Without trusted data, farmers remain invisible to lenders, and formal financial systems cannot scale agricultural credit or insurance. This threatens the delivery of the National Agricultural Finance Implementation Roadmap (NAFIR) 2025–2030, risking a failure to mobilise over 60% of the targeted financing for agricultural transformation.[2]

This policy brief argues that the most urgent reform is strengthening data governance: the rules, institutions, and digital infrastructure that turn fragmented information into trusted public assets.

[1] Data from the National Agricultural Finance Implementation Roadmap (NAFIR) 2025–2030, National Bank of Ethiopia & Ministry of Agriculture.
[2] Estimated annual financing gap according to national estimates described in the NAFIR 2025-30 Document

The proposal centres on establishing the National Agricultural Data Exchange Framework (Agri-Stack) as the foundation for Ethiopia's digital agricultural transformation, ensuring secure, consent-driven, and interoperable data flows between farmers, government agencies, and financial service providers (FSPs).

Phased Recommendations

Phase 1 – Pilot: Consent-Driven Data Exchange (2025–2026)

- Enact a Farmer Data Consent Regulation that empowers farmers to authorise the use of their personal and farm-level data by FSPs.
- Pilot core registries for farmer identification (ID), land registry, and livestock records across selected woredas (districts) with high agricultural output but limited access to credit.
- Establish a Joint Steering Committee involving representatives from the Ethiopian Agricultural Transformation Institute (ATI) and the National Bank of Ethiopia (NBE) to coordinate pilots and align them with ongoing NAFIR implementation.

Phase 2 – National Roll-Out: Institutional Oversight and Technical Standards (2027–2030)

- Adopt open technical standards and APIs enabling interoperability between land, crop, and identity systems.
- Institutionalise data stewardship functions within key ministries to ensure data quality, security, and ethical use.
- Create sandbox environments for banks, insurers, and agritech firms to test and scale innovative Agri-Finance products.

1. Why Data Governance Matters for Agricultural Finance

1.1 Agriculture's Central Role in Ethiopia's Economy

The agriculture sector provides livelihoods for the bulk of rural households and underpins food security, foreign exchange earnings, and industrial inputs. However, productivity growth remains slow, and financial exclusion of smallholder farmers continues to constrain structural transformation.

1.2 The Hidden Data Crisis Behind Financial Exclusion

While public discourse often attributes limited agricultural finance to credit risk or collateral gaps, a deeper constraint lies in data fragmentation and weak data governance. Without reliable, interoperable data on farmers, landholdings, production records, and repayment histories, lenders face high uncertainty and impose high-risk premiums. Consequently, only large commercial farmers or cooperatives can access loans.

Data scarcity thus creates a vicious cycle: farmers without digital records cannot access finance, and without finance, they cannot generate the digital footprints needed to build verifiable credit histories. Breaking this cycle requires a coherent data governance framework that makes agricultural data discoverable, shareable, and trustworthy.

1.3 National Policy Context

Ethiopia's Digital Strategy 2025 and the Digital Agriculture Roadmap (DAR) 2032 both recognise the importance of data-driven transformation.[3] The NAFIR 2025–2030, jointly implemented by the NBE and the Ministry of Agriculture (MoA), identifies the lack of verifiable collateral substitutes, such as digital land titles, production histories, and farmer IDs, as the main bottleneck to scaling agri-finance.

However, these strategies operate in a data vacuum, lacking the governance framework necessary to connect digital systems across ministries and financial actors. Strengthening data governance is therefore not an optional add-on but the precondition for achieving the targets of the Digital Ethiopia 2025 and NAFIR agendas.

2. The Cost of Fragmented Agricultural Data

2.1 Financial Loss and Inefficiency

The absence of trusted agricultural data leads to high transaction costs, manual verification processes, and inflated risk premiums for financial institutions. These inefficiencies resulting in unfulfilled demand represent an annual gap of approximately ETB 2,530 billion (or $2.53 trillion) in missed investment opportunities.[4] Farmers face higher borrowing costs, and FSPs limit exposure to rural lending.

[3] Digital Ethiopia Strategy 2025. Ministry of Finance, FDRE
[4] Digital Agriculture Roadmap 2032. Ministry of Agriculture & Ethiopian Agricultural Transformation Institute.

For instance, verification of land ownership often requires cross-checking paper-based records across multiple bureaus. Discrepancies between datasets from the MoA, the National Rural Land Administration Information System (NALIAS), and regional administrations create systemic uncertainty.

2.2 Stalled NAFIR Targets

The NAFIR roadmap envisions three non-traditional collateral substitutes:

- Verified land titles,
- Authenticated production histories, and
- Digital farmer identities.

These data points are intended to de-risk agricultural lending and insurance. Meanwhile, fragmented databases make them inaccessible to FSPs, stalling the roll-out of key NAFIR instruments such as risk-based credit scoring, blended finance mechanisms, and digital crop insurance.

2.3 Data Sovereignty and AI Risks

Without domestic data governance structures, Ethiopia risks external dependency on foreign digital platforms and technology vendors. Unregulated data flows could lead to the exploitation of agricultural data as an economic resource without local benefit. Moreover, the lack of structured datasets limits the potential of Artificial Intelligence (AI) and machine learning to improve agricultural forecasting, crop insurance models, and climate adaptation.

3. Root Causes of Data Fragmentation

3.1 Institutional Fragmentation

Multiple government institutions collect agricultural data for their mandates, but there is no overarching governance mechanism to coordinate or harmonise it.

- ATI manages agricultural innovation data.
- MoA oversees extension, inputs, and production data.
- NALIAS manages land records.
- NBE holds financial sector data.

Each operates with separate databases, formats, and identifiers, creating duplication and inconsistency.

3.2 Weak Legal and Regulatory Foundations

While the Personal Data Protection Proclamation No. 1321/2024 establishes general requirements for consent, rights of data subjects, and obligations, it lacks sector-specific operational guidelines for agricultural data sharing. There are no explicit provisions governing public–private data exchange, for example, or the use of data as collateral substitutes. As a result, even well-intentioned data-sharing initiatives face legal uncertainty.

3.3 Technical Barriers

Data systems lack unique identifiers, interoperability standards, and APIs to enable secure exchange. Many records remain paper-based, unstructured, or incomplete. Metadata and validation protocols are inconsistently applied, undermining data quality.

3.4 Trust Deficit

Farmers often hesitate to share data due to limited awareness of their rights and fears of misuse. In the absence of transparent consent mechanisms or tangible benefits, trust in digital systems remains low. This “trust deficit” is both a social and institutional governance challenge.

4. Global and Regional Lessons

4.1 India’s Agri-Stack and Unified Farmer Service Interface (UFSI)

India’s Agri-Stack demonstrates how data governance reform can unlock agricultural finance. The system integrates farmer IDs, land records, and production data into interoperable registries linked to a digital consent mechanism. Farmers can authorise data sharing with banks or insurers via a unified digital platform. This has facilitated millions of smallholder loans and crop insurance products.[5]

Key takeaways for Ethiopia:

- Consent-based data sharing ensures farmer agency and trust.
- Federated architecture prevents centralisation while maintaining interoperability.
- Institutional leadership (e.g., India’s Ministry of Agriculture & Farmers' Welfare and National Institution for Transforming India Aayog) provides clear accountability.

[5] Ethiopian Agricultural Transformation Institute (ATI) (2025). Agri-Innovation Deck: Building Digital Public Infrastructure.

4.2 Kenya's Integrated Agricultural Management Information System (KIAMIS)

Kenya's KIAMIS provides another instructive example. Anchored in the 2019 Data Protection Act, it emphasises data quality assurance, access controls, and standardised protocols across county administrations. The governance structure clarifies roles between national and local authorities, improving accountability and efficiency.[6]

For Ethiopia, with its federal system, Kenya's model offers a useful precedent for federated data stewardship, balancing regional autonomy with national standards.

5. **Reform Opportunities:** Building Ethiopia's Agri-Data Governance Framework

4.1 India's Agri-Stack and Unified Farmer Service Interface (UFSI)

The proposed Agri-Stack represents a phased, federated data infrastructure governed by clear legal, institutional, and technical standards. It would operationalise NAFIR's objectives by turning fragmented data into a trusted foundation for inclusive finance.

Source: Author's construction

[6] Data Governance Framework for Farmers' Registration and Roadmap Towards Operationalization (2022). Ministry of Agriculture, Livestock, Fisheries, and Co-operatives, Kenya.

Pillar 1: Legal and Policy Reform – Data Rights and Consent

- **Farmer Data Rights and Consent Regulation:** Introduce a regulation under the 2024 Data Protection Proclamation establishing farmers' ownership over personal and farm data. Data sharing should be based on digitally verifiable consent, particularly for credit, insurance, and subsidy schemes.
- **Data-for-Finance Policy:** Recognise verified agricultural data (e.g., land records, yield data) as acceptable substitutes for traditional collateral within NAFIR's de-risking framework.
- **Data-Sharing Agreements (DSAs):** Develop formal DSAs between ATI, NBE, MoA, and private FSPs defining permissible data flows, access protocols, and liability provisions.
- **Data Sovereignty Provisions:** Critical agricultural data must be stored within Ethiopia in a secure database, preventing dependency on external cloud vendors, a mandate supported by the Soil and Agronomy Data Management, Use and Sharing Directive No. 974/2023.[7]

Pillar 2: Institutional Alignment – Governance and Stewardship

- **Joint Oversight Body:** Establish an Agri-Data Governance Council jointly chaired by ATI and NBE, integrating the existing NAFIR Steering Committee.
- **Designated Data Stewards:** Appoint data stewardship teams within key ministries, including MoA, Land Administration, and Finance, to ensure data quality, validation, and compliance.
- **Independent Audit and Accountability:** Institute regular audits of data use and integrity, with annual public reporting to reinforce transparency.

Pillar 3: Technical Infrastructure – Building the Agri-Stack

The Agri-Stack should consist of three interoperable layers:

1. **Core Registries (Foundational Data Assets)**
    - Farmer Profile and ID Registry (linked to the national digital ID/Fayda system).
    - Verified Farm Land Registry (geo-referenced to verify ownership).
    - Crop Production and Transaction Registry (recording yield, input use, and sales data).

[7] World Bank (2023) Digital Agriculture in Africa; UNECA (2023) AI and Agriculture in Africa; FAO (2022) Digital Agriculture Policy Toolkit.

Pilot implementation should start in two to three regions, e.g., Oromia, Amhara, and Tigray, where Agricultural Transformation Institute Farmer Profile and National ID Program activities are most advanced. Currently, there is a collaborative effort between the Ministry of Agriculture, Land Management System, Agricultural Transformation Institute - Farmer Profile, and National ID Program in four woredas (Villages) in Oromia, Amhara, and Southern Ethiopia, as well as the Tigray region.

Pillar 4: Trust, Capacity, and Inclusion

- **Farmer Digital Literacy and Awareness:** Implement outreach campaigns through cooperatives and extension officers to explain data rights and consent processes.
- **Capacity Building for Public Institutions:** Train civil servants and regulators in data stewardship, privacy management, and interoperability standards.
- **Gender-Sensitive Data Governance:** Ensure registry systems capture women's land ownership and production data to correct systemic exclusion.
- **Ethical AI and Data Ethics Framework:** Develop guidelines for responsible AI use in agricultural data analytics and credit scoring.

6. Implementation Roadmap and Expected Outcomes

Table 1 : Implementation roadmap

Timeline	Key Activities	Lead Actor (Responsible Institution)
Phase One	Draft and enact the Farmer Data Consent Regulation; pilot registries in selected woredas; establish the ATI–NBE joint oversight body.	Ministry of Agriculture, Agricultural Transformation Institute, National Bank of Ethiopia
Phase Two	Develop open APIs and interoperability standards; expand pilots to all regions; implement a data steward network.	Ministry of Agriculture, Agricultural Transformation Institute, National ID Program
Phase Three	Nationwide integration of Agri-Stack, an operational sandbox for fintechs, and a monitoring and evaluation framework.	Agricultural Transformation Institute, National Bank of Ethiopia, National ID Program
Phase Four	Continuous improvement, data quality audits, and expansion to other value chains (livestock, forestry).	Agricultural Transformation Institute

Expected Outcomes

- Reduction in data verification time for agricultural loans.
- Increased agricultural credit portfolio share in total lending.
- Improved targeting of insurance and subsidy schemes.
- Enhanced farmer trust and participation in digital finance ecosystems.

7. Conclusion: From Fragmentation to Financial Inclusion

A coherent Agri-Data Governance Framework is not a technical add-on but a structural reform that will guide Ethiopia's path towards inclusive, sovereign, and data-driven growth. By institutionalising consent-based data sharing, strengthening stewardship across agencies, and building interoperable digital infrastructure, Ethiopia can transform agricultural data into a productive national asset.

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