DEVELOPMENT GATEWAY
An IREX Venture

Connecting Human, Animal, and Farm

A Case for Investing in Animal ID for DPI

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Background

Researchers from the University College London's Institute for Innovation and Public Purpose define Digital Public Infrastructure (DPI) as 'shared digital systems that support service delivery, foster innovation, and enable social and economic development.'[1] Building on this foundation, the 2025 Global DPI Summit marked a shift from theory to practical implementation, raising pressing questions about how DPI adoption and scale could be expanded. Successful DPI implementation will depend not only on the speed of deployment but, more importantly, on user adoption and the development of connected services that enable social and economic outcomes. Looking ahead, such implementation will require deeper integration of DPI into key sectors and precise alignment with core user needs and services.

DPI can enable agriculture investments to achieve scale, breaking down siloes and reducing the fragmentation that often prevents digital opportunities from having a widespread impact.[2] The transformative potential of DPI implementation in agriculture is widely recognized – for example, farmers that register land, livestock, and crops using a government ID can unlock access to critical services that transform their productivity.[3] Farmers can similarly use registered cattle as collateral to expand their access to markets; they can also use livestock data to speed up disease tracing and quickly identify and contain public threats during emergencies.[4]

Why, then, should animal IDs be the focus of DPI in agriculture, rather than other parts of the agricultural value chain? The answer is simple: animal IDs have not yet been widely explored or integrated within DPI for agriculture frameworks. Similar to how government-approved identification can change what services humans have access to, animal identification can change farmer accessibility to national, regional, and global markets by creating a trusted paper trail. In Uruguay, for example, deployment of a livestock traceability system (with a strong animal ID foundation) permitted Uruguayan farmers to enter the European Union export market for the first time, allowing them to charge (and receive) higher prices for their cattle because of the increased transparency.[5]

1 Eaves, D; Rao, K. (2025). Digital Public Infrastructure: a framework for conceptualisation and measurement. UCL Institute for Innovation and Public Purpose. https://www.ucl.ac.uk/bartlett/sites/bartlett/files/dpi_conceptualisation_and_measurement.pdf

2 Vital Wave et. al. (2025). See pg. 8. https://vitalwave.com/wp-content/uploads/2025/09/DPI-Approach-for-Agriculture-Sector_Final_.pdf

3 The World Bank Group. (2018). The Role of Digital Identification in Agriculture. See pg. 1 https://documents1.worldbank.org/curated/en/655951545382527665/pdf/The-Role-of-Digital-Identification-in-Agriculture-Emerging-Applications.pdf?utm_source=chatgpt.com

4 Ibid, at pg. 11

5 Ibid, at pg. 12.

How DG Implemented DPI for Livestock in Ethiopia

Through the 'a Livestock Information Vision Ethiopia' (aLIVE) program, DG is building DPI for the livestock subsector in conjunction with the Ethiopian Ministry of Agriculture. Established in 2022, the aLIVE program has built functionalities that allow livestock data to be exchanged between stakeholders. Prior to aLIVE, livestock data was stored across multiple formats across different databases, creating accessibility issues and preventing comprehensive data analysis and comparison. Stakeholders only had access to portions of Ethiopia's livestock data, limiting their ability to make data-based decisions. To resolve these issues, aLIVE introduced a national livestock data standard, determined a data governance architecture and related protocols, and built a harmonized livestock information system. aLIVE's chief focus has been on developing data exchange infrastructure.

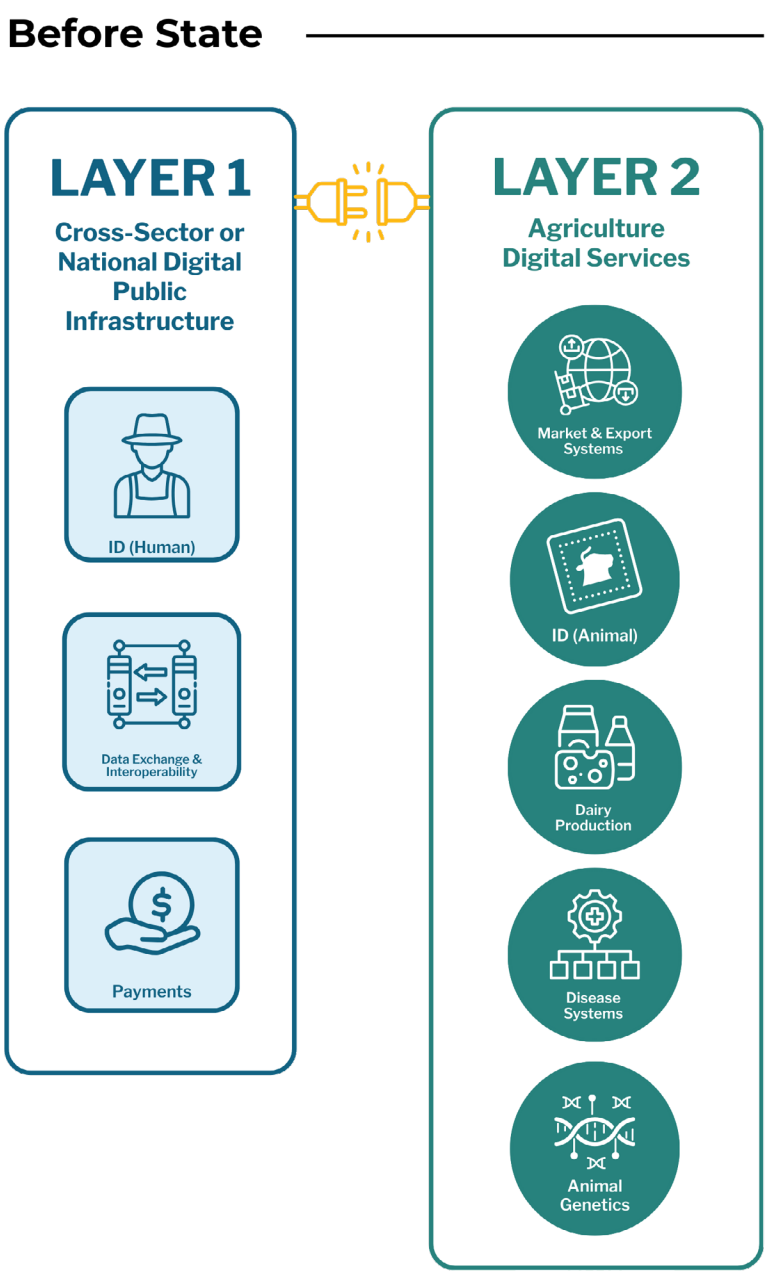
As detailed in the following sections, the linking of animal IDs to farmer registries could unlock deeper insights into the life cycles of farm animals while boosting the prosperities of farmers. While many of DG's insights come from Ethiopia, the opportunities unearthed from investing in animal IDs are applicable beyond the country.

What Does Ideal DPI for Animals Look Like?

Ideal DPI for livestock should include, as a foundation, a strong animal ID and traceability system component. A common ID and data standard that smoothens data exchange will not only strengthen existing systems and facilitate connection to DPI building blocks (payment, ID, and data exchange) but also prepare many countries for the infrastructural and data demands that AI innovations will require in the near future.

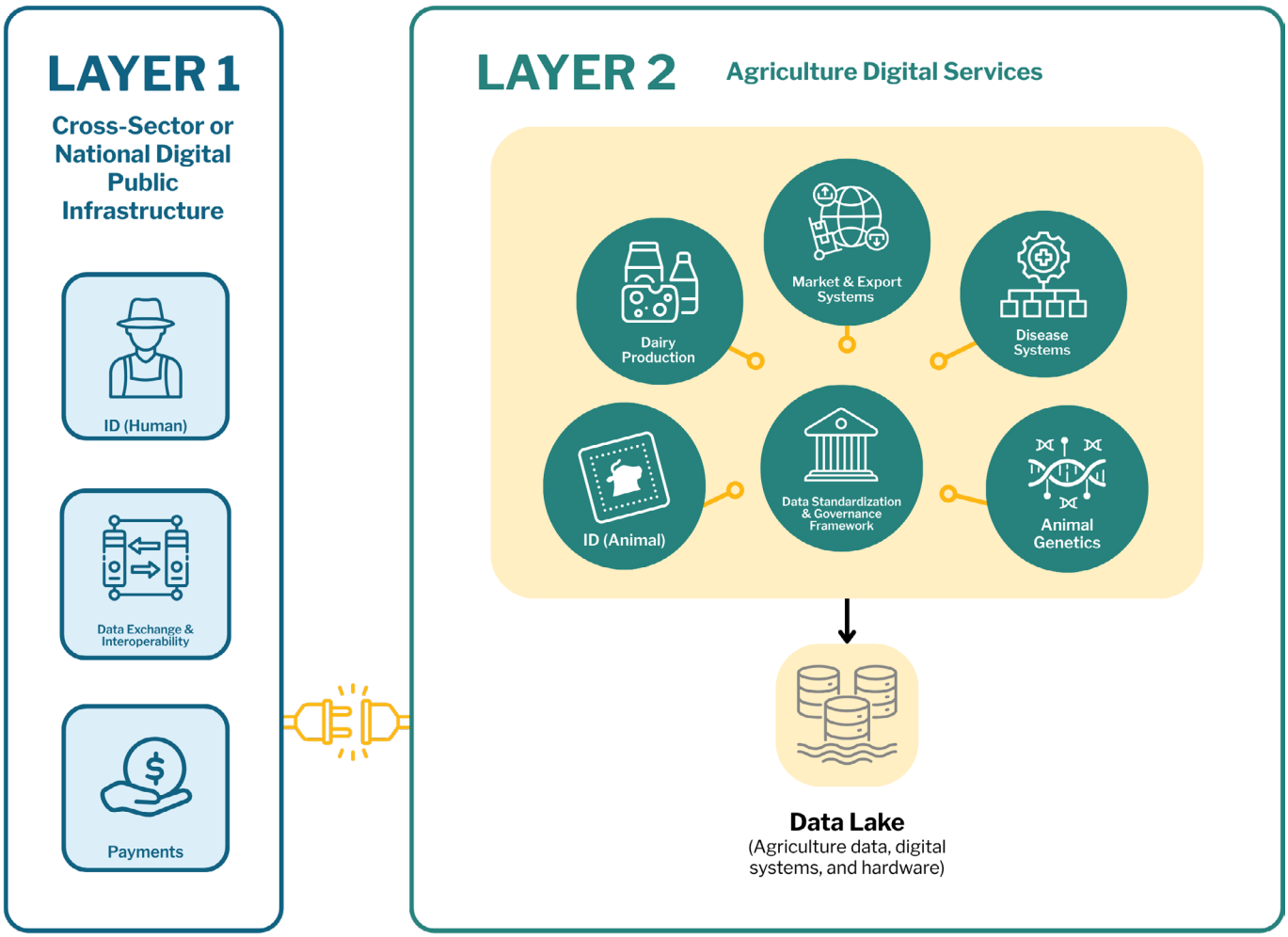
Most countries are at different levels of DPI maturity - many have disconnected systems, while a few are pursuing interoperability and strengthening supply chain decision-making by bringing processes and systems together. To the best of DG's knowledge, no countries are taking a 'whole-of-sector' approach that connects systems, DPI layers, and AI preparation measures. Deepening investment in animal IDs could serve as a powerful business case across the agriculture sector and beyond, accelerating efforts to bring humans and farms closer together to improve farmer livelihoods.

Mapping the Infrastructure



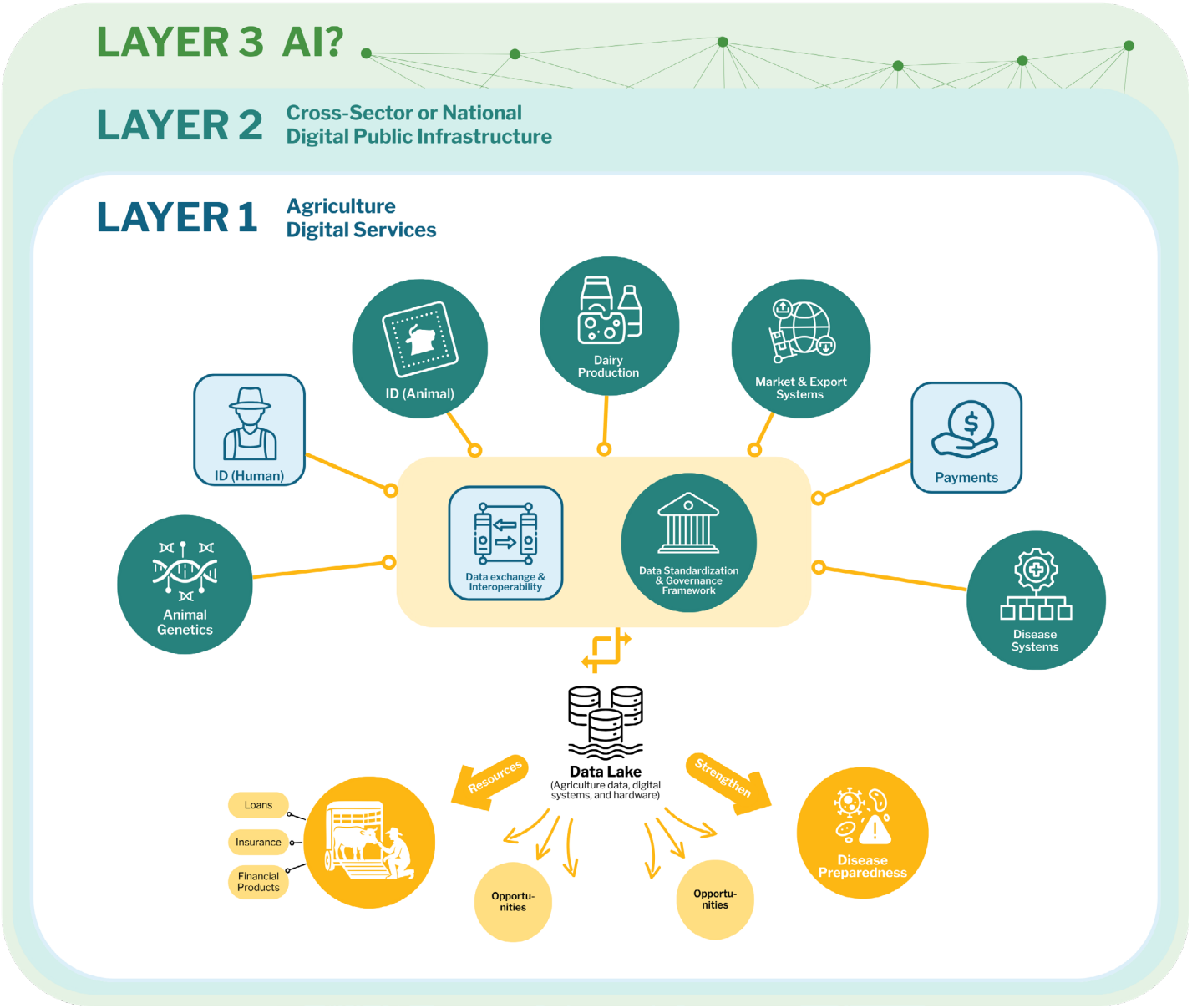
The figure to the left depicts the infrastructure realities of many countries that have invested in digital agriculture. Layer 1 is the national DPI. Layer 2 represents various unconnected agriculture services, where there are no links between animal IDs, animal production processes, animal markets, vaccinations, and other systems. In these environments, integrating DPI and service delivery layers is even more challenging, and the agricultural ecosystem is likely not ready for integration.

Current State



The “Current State” figure represents a harmonized sector (or subsector) system (Layer 2) that is not presently interoperable with the national DPI (Layer 1). In this state, there are rarely systems that connect animals, farms, and farmers. Importantly, there is often repetition of data categories and fields across different systems, spreadsheets, and registries. This signals that shared infrastructure could be appropriate.

After/Ideal State



In the "Ideal State," multiple layers are integrated to improve farmers' lives: the sector-based systems and cross-sector DPI are integrated, allowing for future deployment of AI. By strengthening all the data underpinning a dairy cow (such as life cycle data pertaining to birth/identification, vaccination, dairy production, disease management, and market/export readiness), farmer outcomes can be changed in dynamic ways, especially when that data is connected to information already possessed by the human farmer.

Connecting the farm and the animal through an animal ID is just one use case of many that are possible.. The system operability benefits derived from linking animal IDs to national DPI platforms could also apply to horticultural products, crops, inputs (fertilizer, soil, seeds, etc,), and their associated human producers.

Benefits

Integrating identity and data systems can unlock data-driven benefits in trade, inclusion, public health, and governance. By linking farmer and animal IDs with national payment infrastructure and subsector systems, governments can simplify access to finance for farmers, ensure export standards compliance, and improve participation in trade. This same infrastructure can strengthen disease preparedness, supporting 'One Health' approaches. Notably, these connections lay the foundational infrastructure necessary for government AI readiness.

Boosting Trade and Market Access

Interoperable digital systems connecting production data, import/export data, and payment mechanisms can enable efficient, traceable, and trusted cross-border transactions. Indeed, integrating production and export data with payments can reduce administrative bottlenecks and improve cash flow for both producers and exporters. This interoperability can bolster foreign exchange and compliance through automated verification and record-keeping, which is particularly valuable across different markets and trade systems.

Interoperable digital systems further enable supply-chain traceability, supporting compliance with export market standards. When assets are registered and traceable through a digital ID system, the administrative burden of ensuring that exported beef has met the proper vaccination requirements is limited. Estonia, a global leader in DPI, has linked animal ID registrations to farm IDs, tracking European Union trade compliance standards.[6]

Strengthened Disease Preparedness

The same ID used to track vaccinations, when connected to land registries across databases, also enables authorities to identify and quickly contain public health issues arising from disease.[7] Quick disease elimination also contributes significantly to market traceability, further enabling countries to demonstrate the health and quality of their animals. Animal disease can have a direct impact on humans, as evidenced by a recent study that explored how human-animal interactions led to the SARS pandemic in 2002 and (possibly) the COVID-19 epidemic in 2020.[8] Scientists believe pandemics will increase in the future as human-animal interactions intensify.[9] The current disjointed state of animal disease and human disease tracking will make preparedness difficult; as such, a unified, interoperable

6 Government of Estonia. (2021). Identification and registration of bovine animals. https://www.pria.ee/sites/default/files/2021-12/Bovine_2021.pdf

7 World Bank, at pg. 16.

8 Bard, S. (2025). Bat Virus Evolution Suggests Wildlife Trade Sparked COVID-19 Virus Emergence in Humans. UC San Diego Today. https://today.ucsd.edu/story/bat-virus-evolution-suggests-wildlife-trade-sparked-covid-19-virus-emergence-in-humans

9 Ibid.

approach to improving the monitoring of animal and human disease (known as One Health) will be needed.[10] Connecting animal disease platforms to animal IDs, farmer IDs, and/or farm registries could allow animal and human health specialists to more quickly and accurately identify and isolate disease and stem the rise of future epidemics.

Greater Farmer Incentives and Financial Inclusion

In an ideal world, livestock farmers could use data that shows how much their animals produce over time to secure investment and other critical financial inputs in farming operations. Connecting animal IDs, farmer IDs, and farm registries can support the registration and verification of farmer collateral, decreasing risks stemming from lack of information and increasing the data available for loans, insurance, and other financial products that benefit farmers. The integration of animal IDs with DPI platforms is a particularly key use case in Sub-Saharan Africa, where there are millions of smallholder farms, the vast majority of which are engaged in both crop production and livestock rearing. Such integration would boost financial investments in livestock, allowing farmers to plow resources back into their herds and, by extension, their soils, fertilizers, crops, machinery, and irrigation structures.

Improved Trust in Government

In an environment where rapid digital transformation has coincided with unprecedented levels of distrust in government globally,[11] connecting DPI to concrete service delivery use cases such as animal IDs can help deliver quick(er) wins. Part of building trust in government requires achievement of results. Governments can quickly achieve results by identifying, elevating, and scaling service delivery opportunities that demonstrate value and have an impact on citizens' daily lives. Service delivery in agriculture, health, and other areas is full of opportunities to combine the DPI layer with critical services that meet citizen needs. One opportunity that demonstrates how digital transformation can directly improve livelihoods - sooner rather than later - is the elevation of animal IDs.

10 World Health Organization. (2023). One Health. https://www.who.int/news-room/fact-sheets/detail/one-health

11 Shah, B. (2025). Trust vs Digital Transformation: Can Governments Close the Gap?. Apolitical. https://apolitical.co/solution-articles/en/trust-vs-digital-transformation-can-governments-close-the-gap-621

What's Next: A Call to Action

The scaling of DPI hinges on its integration into existing applications and systems, particularly in key sectors. Given that they are foundational to sector-scaled DPI, animal IDs present smallholder farmers with an opportunity to further economic development, public health, and trade access.

By investing in animal IDs now, governments and donors can shift from broad DPI investments to tangible, transformative service delivery that builds trust, increases economic gains, and enables resiliency and flexibility for the future.