From Strategy to Scale

Why Delivery Matters in Digital Agriculture

January 2026
By Niriksha Shetty, Jonathan Lehe, Habtamu Yesigat, Ashish Kamra,
Zoe Karl-Waithaka, Sonya Hoo, Akshay Pant and Eric Murithi

BCG + PxD PRECISION DEVELOPMENT

Boston Consulting Group
Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders: empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

Precision Development
Precision Development (PxD) is a global nonprofit organization that acts as a bridge between smallholder farmers and the innovations they need. We design, test, iterate and scale services that enable farming households to manage risks and increase their incomes. We also advise governments on digital agriculture strategy.

Our primary innovation has been providing high-impact digital agricultural information to smallholder farmers via mobile phones. Evidence from randomized evaluations shows that PxD's services improve farmers' production, profits, and climate resilience and are extremely scalable and cost-effective to deliver to millions of farmers.

Contents

Introduction:

Unlocking the Power of Digital Agriculture

Why Digital Agriculture

Across low- and middle-income countries, **smallholder agriculture remains the backbone of livelihoods, food security, and national economies. Yet farmers continue to face persistent challenges** such as fragmented value chains, limited access to timely and accurate advisory services, lack of access to high-quality inputs and credit, and growing climate volatility.

Simple digital tools such as **SMS-based advisory platforms, interactive voice response (IVR) systems,** and **mobile-enabled farmer registries** are proving powerful in addressing these constraints. These solutions can **significantly benefit farmers** while enabling governments and development partners **to reach them faster, at lower cost, and with greater precision**. They often serve as the entry point for broader digital ecosystems. As **digital ecosystems mature, more advanced technologies** such as AI-powered weather forecasting and digital credit scoring are being layered in to drive further precision and personalization.

In East Africa, Virtual Agronomist illustrates this potential, delivering digital advisory services at roughly **one-tenth the cost of traditional extension** (around **USD 1-2 per farmer per season**), and helping **farmers increase yields by up to 1.4-1.9x** for crops such as maize, rice, sunflower, and sorghum[1]. Meanwhile, in India, **Krishi Samruddhi (formerly Ama Krushi) in Odisha state, reaches approximately 7.9 million farmers** at a cost of **USD 0.15 per farmer**, helping to reduce severe crop losses by **10%** and pest-related losses by **26%**[2]. In 2025, India's Ministry of Agriculture & Farmers' Welfare (MoA&FW) also disseminated AI-powered seasonal weather forecasts to **nearly 38 million** farmers across 13 states via SMS (m-Kisan), enabling planting decisions based on longer lead forecasts[3].

Together, these examples illustrate how well-designed digital solutions, when built for scale and inclusivity, can reshape how agricultural services are delivered and amplify their impact. They are not incremental add-ons, but catalysts for system-wide transformation. **Digital agriculture has the potential to increase agricultural GDP in low- and middle-income countries by up to USD 500 billion annually**[4], provided solutions are effectively scaled, widely adopted, and proven in their impact. Beyond productivity gains, it also **offers a unique opportunity to promote inclusion and equity,** particularly for women and youth.

As digital agriculture gains traction, many countries are developing overarching strategies or "roadmaps" to guide investment and coordinate action. These frameworks set out a shared vision for how digital can accelerate transformation across the agriculture sector.

1. https://www.isda-africa.com/impact/
2. https://voxdev.org/topic/agriculture/customised-agricultural-advice-scale-how-digital-extension-helps-indian-farmers
3. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2166074&utm&reg=3&lang=2
4. https://agribusinesstv.info/wp-content/uploads/2023/11/State_Digital_Agriculture_Sector_Report_En.pdf

Digital Agriculture Roadmaps as a starting point

Over the past few years, Ethiopia, the Indian state of Odisha, and the African Union have launched **Digital Agriculture Roadmaps**, while Kenya, Nigeria, and India (at the national level) are advancing similar efforts through draft strategies and policy frameworks. These initiatives reflect a growing **recognition that digital tools and information can play a pivotal role in transforming agriculture systems.**

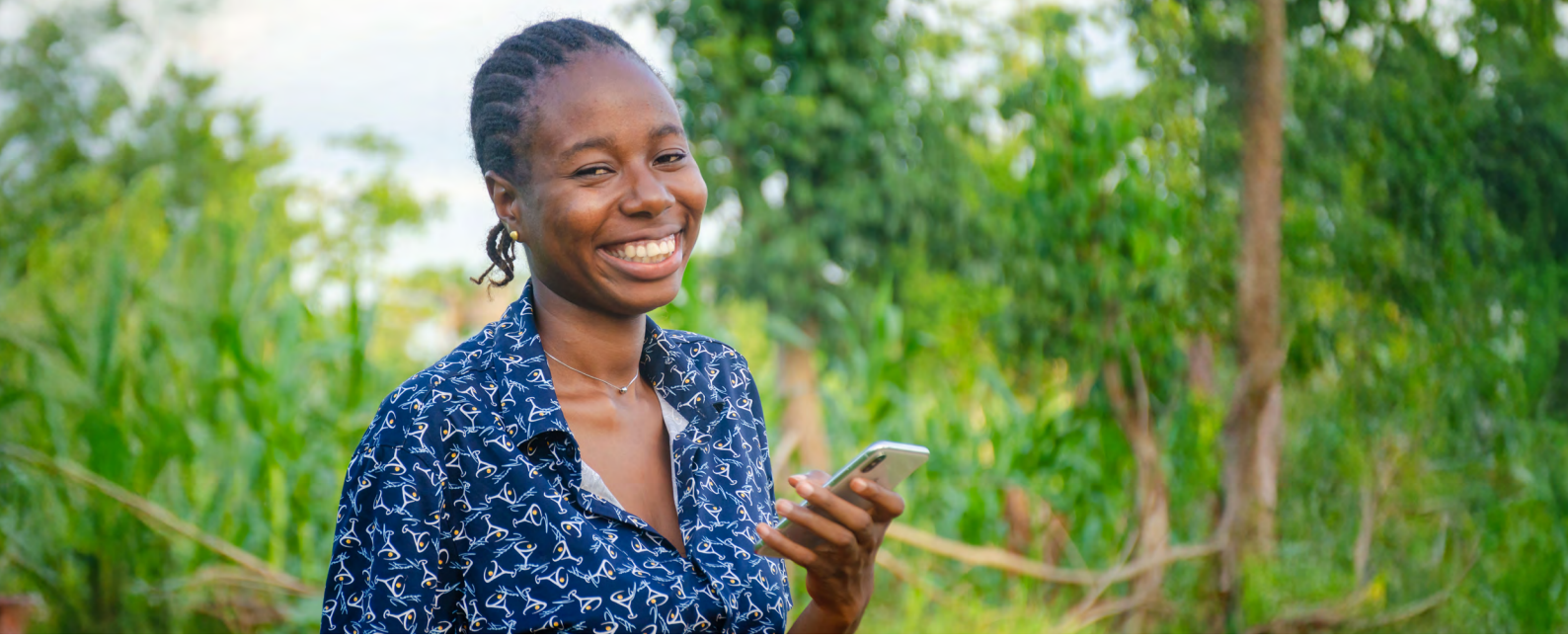
Digital Agriculture Roadmaps are powerful instruments for aligning vision, guiding investment, and structuring implementation. When well designed, they provide a clear framework to:

- **Align ministries, development partners, and private sector actors** around a shared vision
- **Prioritize use cases and enabling initiatives** based on national priorities, farmer needs and local context
- **Sequence and support delivery** from fragmented pilots to scaled outcomes
- **Enable coordinated investment and results-based planning**

Yet strategies alone cannot deliver impact. In many instances, digital initiatives remain fragmented, underfunded, and weakly adopted. Globally, **adoption of digital agriculture tools among smallholder farmers remains low, typically under 15%**. While precise estimates of the funding gap for digital agriculture are not readily available, OECD data indicates that between 2019 and 2021 the public sector invested only USD 17 billion in agricultural digital infrastructure across OECD countries. This **represents just 2% of total agricultural spending, underscoring digital agriculture's significant underfunding**[5]. As a result, implementation often stalls, promising pilots fail to scale, and smallholder farmers (especially women and marginalized groups) continue to be left behind. This persistent **strategy-to-delivery gap** has been observed across multiple contexts regardless of strategy quality and stems from a lack of dedicated delivery capacity, sustained coordination, and operational accountability.

Bridging this gap requires more than stronger plans. It requires dedicated **delivery capacity** that can coordinate across actors, align incentives, troubleshoot implementation, and track progress toward results. This is where **Digital Agriculture Units (DAUs)** come in.

5. https://agribusinesstv.info/wp-content/uploads/2023/11/State_Digital_Agriculture_Sector_Report_En.pdf



From Plans to Progress:

Powering Delivery Through DAUs

DAUs are emerging institutional models within governments or national programs, designed to translate digital agriculture strategies into tangible outcomes. They serve as dedicated engines that coordinate stakeholders, support delivery, and drive accountability across ministries, development partners, and the private sector.

Building upon lessons from delivery units in agriculture and other sectors, DAUs are increasingly being used to help governments move from planning to action. **Well-designed DAUs typically perform four core functions:**

- **Investment-oriented planning:** Turning national or sub-national roadmaps into actionable and financially viable implementation plans, including identifying priority use cases and building the business cases needed to mobilize public and private investment.
- **Stakeholder coordination:** Convening government agencies, development partners, and private sector actors to drive alignment on priorities, reduce duplication, and channel collective resources toward high-impact initiatives. DAUs can also strengthen information flow across institutions, helping ensure that decisions are based on shared data and evidence.
- **Delivery support:** Tackling operational and institutional bottlenecks, including supporting the resolution of governmental constraints, facilitating access to resources, and flagging major delivery needs such as last-mile service delivery for hard-to-reach populations, digital literacy challenges, or data connectivity gaps in specific areas.
- **Accountability and visibility:** Establishing systems to track implementation and results, using dashboards, delivery trackers, and other data tools to monitor progress, flag risks early, and communicate outcomes to decision-makers and the public. This transparency helps maintain momentum, build trust, and attract continued investment.

While DAUs tend to share a common mandate, their structure and setup can vary. The way a DAU is designed, including its institutional anchoring, mandate, and resourcing model, is critical to its effectiveness. Establishing the right design early, tailored to each country's context and needs, enables the unit to deliver on its mandate with clarity, authority, and lasting impact.

Design for Delivery:

Archetypes of Digital Agriculture Units (DAUs)

A DAU's effectiveness ultimately depends on its institutional design: how it is positioned, governed, and resourced within the broader public system. These design choices need to reflect a country's context, for example, administrative structure, policy priorities, and implementation capacity.

Figure 1 below outlines five key dimensions across which design choices can be made when establishing a DAU.

These dimensions shape where the unit is anchored, what it is accountable for, how it delivers on its mandate, and how it is staffed and sustained. Together, they offer a useful lens to **tailor institutional models** to local context and to navigate the trade-offs that influence performance and long-term sustainability.

EXHIBIT 1

Design dimensions for DAU archetypes

5 core design dimensions to classify DAU archetypes

Structure	Dimension	Description
Institutional set-up	1 Institutional anchoring	• Defines where the DAU is located, within a ministry or as an independent entity • Determines the level of autonomy the DAU has to shape its agenda and drive change • Influences how seamlessly the DAU integrates with broader government systems and processes
	2 Reporting line	• Defines the authority level to which DAU reports (e.g., Minister, senior official, or technical unit) • Determines the DAU's access to decision-makers and ability to advance cross-sector initiatives • Influences its role and visibility in policy dialogue and inter-ministerial coordination
Mandate and scope	3 Delivery mandate	• Defines whether the DAU's role is limited to coordination or includes direct implementation • Determines the scope of responsibilities, from policy design to delivery management • Influences the partnerships, capabilities, and operating model the DAU will require
	4 Jurisdictional scope	• Defines the geographic coverage, national or subnational (e.g., regional/state level) • Determines alignment with the degree of decentralization in the country's governance system • Influences how the DAU engages with local governments, institutions, and stakeholders
Resourcing	5 Resourcing model	• Defines the composition of the team, civil servants, external experts, or blended staffing • Determines the DAU's agility, technical depth, and institutional memory • Influences required staffing budget and whether costs are government-funded or partner-shared

1 **Institutional anchoring:** Where a DAU is placed shapes its authority and integration into the larger ecosystem. Locating it in the Ministry of Agriculture (MoA) can strengthen alignment with agricultural programs, especially in early phases when systems are sector specific. However, MoAs often face capacity constraints, and an alternative anchoring in a central body that might have more capacity (e.g., Presidency, Planning, ICT) or as an independent unit can offer stronger oversight, more cross-sector reach, and faster delivery. There is no single "best" option and countries need to balance sector ownership, technical capability, and political visibility based on local context. In some cases, split models with delivery teams embedded in MoAs and coordination led centrally can be effective as well.

2 **Reporting line:** Direct reporting to a senior political figure, such as a Minister or President's office, gives DAUs the authority to coordinate, shape decisions, and maintain momentum. This is especially critical in early phases when reforms are politically sensitive or fast-moving and require quick wins to drive momentum. Over time, reporting may shift to technical ministries, but maintaining high-level visibility helps sustain alignment. Notably, even if platform governance transitions to ICT or digital agencies, having dedicated digital capacity within MoAs remains important to ensure long-term continuity.

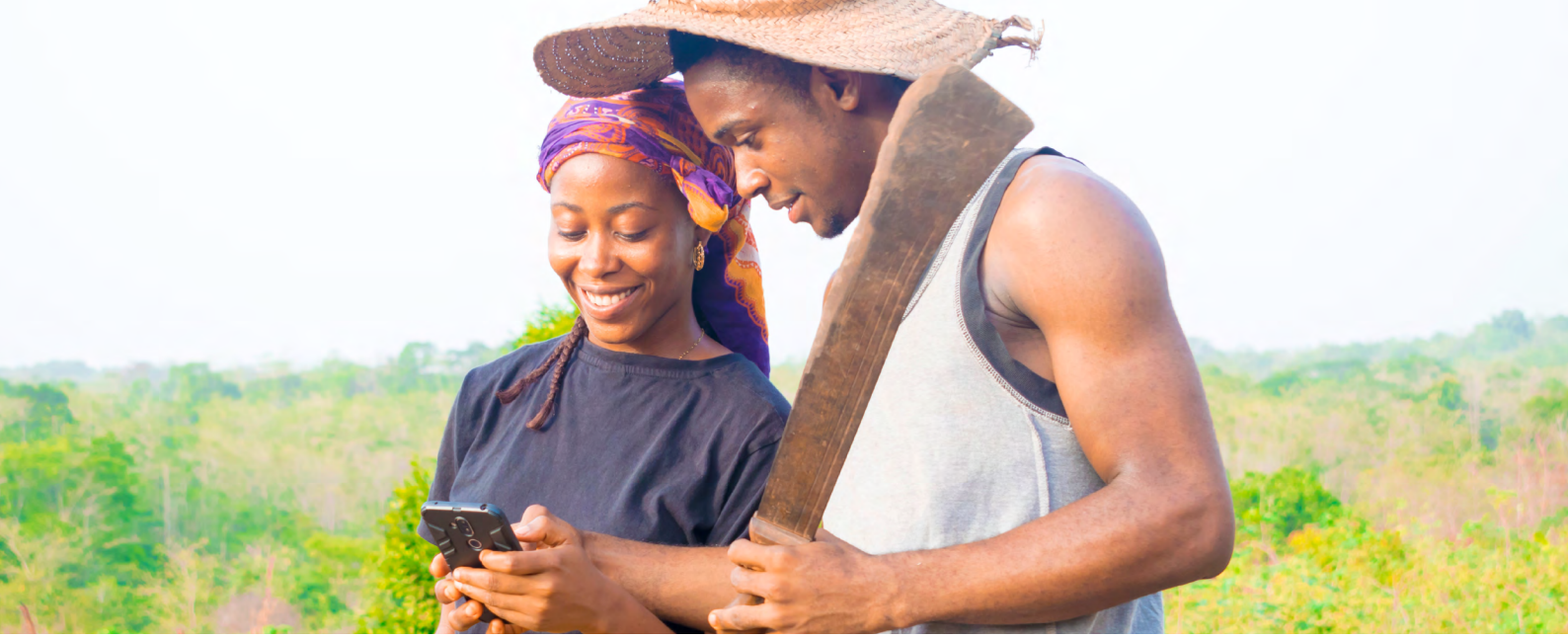
3 **Delivery mandate:** DAUs can serve as coordinators, implementers, or follow a hybrid model. In contexts where strong delivery partners already exist, DAUs may focus primarily on driving alignment, setting standards, and coordinating investments. Where ownership of key digital public goods is limited, DAUs may directly lead delivery for initiatives such as registries or public advisory platforms. Often DAUs tend to evolve into the hybrid model. Overall delivery mandates need to reflect gaps in the ecosystem and be designed to avoid duplication.

4 **Jurisdictional scope:** DAUs at the national level often define vision, set standards, and manage shared platforms. In federal or devolved systems, impact requires strong sub-national engagement, via embedded teams, coordination structures, or devolved delivery channels. Jurisdictional scope should also extend beyond the public sector. Ensuring engagement with the private sector through advisory forums, public private partnerships (PPPs), and co investment platforms can unlock innovation, mobilize complementary capabilities, and accelerate scale. Over focusing on public actors alone increases the risk of fragmentation, duplication, and missed opportunities for transformative outcomes.

5 **Resourcing model:** Most governments face gaps in technical capabilities such as digital systems, data infrastructure and AI. Hybrid Project Management Unit[6] (PMU) teams that combine public officials with externally seconded or embedded experts offer a practical way to deliver quickly while building institutional capacity. While some of the PMUs have been time-bound, others have evolved into enduring structures embedded within government systems. The resourcing model also shapes long-term financing, whether through government budgets, structured PPPs, or co-funding arrangements that sustain delivery capacity over time.

These design choices are interdependent and should evolve with the country's context. A DAU might begin as a lean, centrally anchored team, and later expand into a hybrid structure or devolve closer to implementation. What matters most is intentionality, **designing a model that fits today's needs and can adapt as systems mature and evolve over time.**

6. Project Management Units (PMUs) are teams developed to manage, guide, and monitor the implementation of the country's digital agriculture roadmap (DAR), especially in its early stages before the establishment of a permanent digital agriculture unit (DAU)

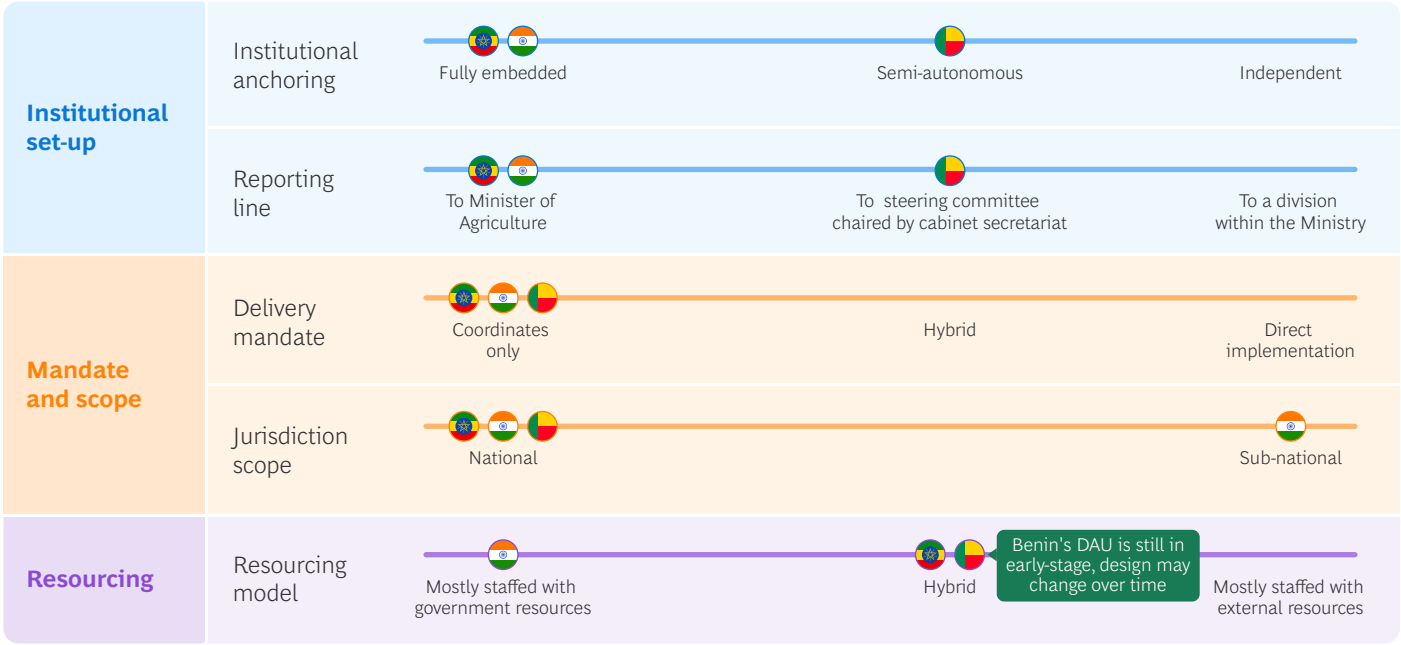


Emerging Models of Digital Agriculture Units:

How Governments are Organizing for Delivery

EXHIBIT 2

DAU design choices by countries[7]



Source: Ethiopia Digital Agriculture Roadmap 2032; DFS Odisha Roadmap 2023; World Bank Digital Agriculture Roadmap Playbook; National Strategy for e-Agriculture in Benin 2020-2024;BCG Analysis

7. The design choices outlined above are expected to evolve further as countries progress from design to early implementation to institutionalization

Institutional Setup: How countries are structuring Digital Agriculture Units

DAUs are embedded in institutional arrangements that reflect each country's governance context and are designed to ensure strong coordination across ministries and partners.

In **Ethiopia**[8] and **India**[9], DAUs are anchored directly within the **Ministries of Agriculture**, reporting to senior leadership. This setup gives them the authority to drive cross-agency collaboration and lead systems-level reforms including oversight of **digital registries, extension platforms,** and **public data infrastructure.**

In **Benin**, by contrast, governance is coordinated through a **Steering Committee,** chaired by the Minister of Agriculture and co-chaired by the Minister of Digital Economy, and supported by a **Technical Committee** that brings together government agencies and civil society.[10] This may reflect a deliberate choice to maintain broader stakeholder inclusion or a more consensus-driven approach to implementation.

Mandate and Scope: Coordination First, with Targeted Delivery

In countries like **Benin, Ethiopia,** and **India**, DAUs are primarily positioned to enable **coordination and stewardship** by aligning stakeholders, setting national standards, and overseeing shared digital public goods such as farmer registries, advisory platforms, and data systems. While some delivery functions remain within line ministries or partner institutions, DAUs provide coherence and strategic direction across the ecosystem. **Kenya's planned DAU,** while at an early stage, may follow a similar logic: a **lean central coordination unit,** with actual delivery to be executed through specialized government departments and implementing partners.

In **India**, for example, while the DAU supported by Precision Development (PxD) plays a strong coordinating role, **core delivery responsibilities for AgriStack components lie with central government institutions,** particularly the **Ministry of Agriculture & Farmers' Welfare** (**MoA&FW**) and its technical departments. These agencies lead development and rollout of key digital public infrastructure such as the federated farmer registry, crop sown database, and village maps underscoring how DAUs can complement but not replace broader government delivery capacity.

Jurisdictionally, DAUs operate at both national and sub-national levels. Ethiopia has established a DAU at the national level, while India illustrates a dual approach of both national and sub-national jurisdiction scope, as seen at the national level and in the state of Odisha.

Despite slight differences, **effective DAUs tend to blend strategic coordination with selective delivery oversight,** ensuring that diverse actors across government, private sector, and development partners operate within a coherent, result-driven framework.

Resourcing: Hybrid Teams for Sustained Capability

Early DAU models have **commonly adopted hybrid staffing** approaches that blend **civil servants** with **secondees and technical experts** from development partners or specialized organizations. This configuration maintains **government ownership** while ensuring access to **cutting-edge technical expertise.**

In **Ethiopia,** for example, the recently formed PMU is staffed by a **blended team** of civil servants and secondees from organizations such as **PxD to supplement short-term capacity, with the goal to create a fully government-led DAU in the long term.** These arrangements have accelerated roadmap implementation and enhanced institutional capacity within government. In **India,** the DAU model also blends internal and external capacity. While it relies more heavily on government personnel, it draws on external experts from PxD and others for technical domains such as **data analytics, benchmarking,** and **digital advisory systems**. In **Benin,** while at an early-stage, a similar hybrid model is taking shape through **multi-stakeholder committees** and **partner engagement,** reflecting an **early-stage of institutional development. Kenya's proposed DAU** also follows a comparable approach, featuring a **lean core team** supported by **technical experts and implementing partners,** a design aimed at balancing **flexibility, capacity-building,** and **long-term sustainability.**

These hybrid models support **"learning by doing"**, building technical capability within government while sustaining delivery momentum. Over time, DAUs may shift toward greater reliance on locally sourced talent. However, fully government-staffed units are not the only desirable end state. In many contexts, long-term sustainability is better achieved through PPPs or other hybrid resourcing models that preserve agility, foster innovation, and ensure continued access to specialized skills.

8. https://www.moa.gov.et/wp-content/uploads/2025/04/Digital-Agriculture-Roadmap-Ethiopia.pdf
9. https://niti.gov.in/sites/default/files/2025-10/Reimagining_Agriculture_Roadmap_for_Frontier_Technology_Led_Transformation.pdf
10. Stratégie nationale pour l'e-Agriculture au Bénin 2020-2024

From Design to Delivery:

What Enables Successful Digital Agriculture Units

Early experience from countries shows that building an effective DAU depends as much on **incentives, behavior, and practical coordination mechanisms** as on formal structure. Even with the right mandate, DAUs can struggle if they adopt a policing or regulatory mindset, if partner and donor initiatives remain unaligned, or if institutional arrangements are created only after strategic roadmap planning is complete. The following design principles outline practical steps to avoid these pitfalls, ensuring that DAUs are positioned to coordinate effectively, align incentives across actors, and maintain continuity from strategy to execution.

1 **Establish continuity and ownership early, integrating DAU formation with roadmap development:** Momentum can be lost when a Digital Agriculture Roadmap (DAR) is finalized before institutional ownership is in place. **The DAU should begin taking shape during or even before DAR development,** ensuring that institutional design, leadership ownership, and capacity planning evolve in parallel with strategic formulation. Even a small, embedded team or single champion that participates from the start of the roadmap design, can preserve institutional memory, sustain partnerships, and ensure a smooth transition from strategy to delivery.

2 **Coordinate through influence (not control) and align incentives for collaboration: DAU's legitimacy depends on being seen as an enabler, not an enforcer.** When positioned as a regulatory or approval body, it risks slowing progress, discouraging innovation, and creating friction with other delivery entities. The most effective DAUs instead act as **facilitators of collaboration,** convening ministries, partners, and private-sector actors around a shared vision, priorities, and common standards. However, coordination alone is insufficient without the right **incentive structures.** For example, funders and implementers could be encouraged to share information by linking **dashboard participation** to benefits like **public visibility, targeted outreach** from the PMU, or inclusion in **strategic convenings.** At the **institutional or staff level,** incentives could include embedding **shared KPIs** in secondees' terms of reference or requiring **joint reporting** as part of funding agreements. These mechanisms help align fragmented actors around **common outcomes.**

3 **Embed visibility and accountability from day one:** To **drive implementation** and **sustain political momentum,** DAUs should create **visibility** around **progress and results.** Without clear **tracking systems,** delivery milestones can be missed, risks go unnoticed, and decision-makers lose engagement. Early investment in basic **program management** including **dashboards, progress trackers,** and **owner-specific milestones,** enables **real-time problem-solving** and **collective accountability.** Examples from **India and Ethiopia** show that even light-touch delivery tracking tools can help DAUs **monitor performance** across roadmap use cases and **convene more productive review sessions** with government leaders and partners.

Call to Action:

From Vision to Scaled Impact

Unlocking the full value of digital agriculture now requires a decisive shift from planning to sustained delivery. Countries that lead will invest not only in strong strategies, but also in the institutional capacity to execute them. This means moving beyond high-level commitments toward operational, budgeted, and accountable action pathways. Each stakeholder group has a clear and critical role to play.

Governments: Institutionalize delivery and prioritize high-value use cases. Governments should translate national digital agriculture ambitions into **costed, sequenced implementation plans** that clarify which use cases and enabling initiatives will be delivered, by whom and by when. The following actions are essential:

- **Establish or empower a Digital Agriculture Unit** with the mandate, resources, and reporting line to coordinate ministries and partners, resolve delivery bottlenecks, and track progress against national targets.
- **Prioritize a focused set of high-return use cases** such as farmer registries, digital advisory, crop intelligence, and integrated data platforms, where evidence demonstrates tangible productivity or resilience gains.
- **Embed delivery routines within the public sector,** including quarterly implementation reviews with senior leadership, standardized KPIs, and transparent dashboards to guide decision-making and resource allocation.

These steps enable governments to shift from fragmented projects to **integrated digital agriculture systems that reliably reach farmers at scale.**

Development Partners: Align support behind national systems. Development partners can accelerate progress by channeling financing and technical assistance toward **strengthening national delivery systems,** rather than isolated innovations. This involves:

- **Aligning resources to national roadmaps** and co-financing implementation plans instead of standalone pilots.
- **Investing in institutional capabilities,** such as data governance, interoperability frameworks, program management units, and sub-national delivery capacity.
- **Coordinating support** through shared planning, reporting, and learning cycles to reduce duplication and transaction costs for governments.

By reinforcing the **systems that will outlast individual projects,** development partners can enable durable, scalable impact.

Private Sector: Build solutions that integrate, scale, and sustain. Private-sector actors can drive scale and innovation when engaged as long-term partners. This requires:

- **Integrating with public digital infrastructure,** including registries, data layers, and advisory platforms, rather than creating parallel systems.
- **Co-designing sustainable business models** with government, ensuring affordability for farmers while maintaining commercial viability through volume and value-added services.
- **Committing to responsible data-sharing practices** that support public-good outcomes without compromising trust or competitiveness.

With aligned incentives, private firms can accelerate adoption, expand service coverage, and contribute to **robust and sustainable national digital ecosystems.**

As the urgency to build more resilient, productive, and climate-smart food systems grows, **one message is clear: the next frontier is delivery. It's time to move from vision to sustained execution, from isolated pilots to scalable national platforms.**

About the Authors

PxD Team

Niriksha Shetty
Chief Executive Officer,
Mumbai office
nshetty@precisiondev.org

Jonathan Lehe
Chief Strategy Officer,
San Francisco office
jlehe@precisiondev.org

Habtamu Yesigat
Director of Programs
Addis Ababa office
hyesigat@precisiondev.org

Ashish Kamra
Project Lead, Digital Agriculture PMU
Delhi office
akamra@precisiondev.org

BCG Team

Zoe Karl-Waithaka
Managing Director and Partner
Nairobi office
Karl-Waithaka.Zoe@bcg.com

Sonya Hoo
Managing Director and Partner
Washington office
Hoo.Sonya@bcg.com

Akshay Pant
Principal
Nairobi office
Pant.Akshay@bcg.com

Eric Murithi
Senior Analyst
Nairobi office
Murithi.Eric@bcg.com

For Further Contact

If you would like to discuss this report, please contact the authors.


BCG
PxD
PRECISION
DEVELOPMENT