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October 2026



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Mobile for Development

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The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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GSMA Innovation Fund

The GSMA Innovation Fund accelerates digital and mobile-enabled solutions addressing global development challenges. Through grant funding and tailored venture-building support, it enables innovative organisations in low- and middle-income countries to scale and amplify social, economic and environmental impact.

For more information, please visit gsma.com/innovationfund

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About this paper

This learning paper synthesises what the GSMA Innovation Fund has learned over a decade of grant-making about the role mobile and digital technology plays in delivering services and improving lives in low- and middle-income countries. It draws on a structured analysis of Innovation Fund grantees working in energy, water and sanitation, the circular economy, agriculture, climate, digital inclusion and assistive tech, together with prior socio-economic impact studies of product end users.

This paper is written for development practitioners, donors and investors, startups and ecosystem actors who design, fund and evaluate digitally enabled interventions. It establishes where mobile technology is likely to add value, how it does so, and what conditions need to be in place for that value to reach the people an intervention is meant to serve.

A note on evidence and framing

Digital systems reliably tell us how a solution is used and how it grows, but they tell us much less, on their own, about deeper socio-economic change for the end-users. Where this paper refers to improved livelihoods or resilience, the link to digital systems is supported by evidenced by the GSMA's wider monitoring, evaluation and learning (MEL) work, not by the digital data alone.

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Abbreviations

API Application programming interface

ARM Agri-risk management

CRM Customer relationship management

ERP Enterprise resource planning

IoT Internet of Things

IVR Interactive voice response

LMICs Low- and middle-income countries

MNO Mobile network operator

MRV Monitoring, reporting and verification

PAYG Pay-as-you-go

SaaS Software-as-a-Service

SMS Short message service

USSD Unstructured supplementary service data

VAS Value-added service

VSLA Village savings and loans association



EXECUTIVE SUMMARY

For more than 10 years, the GSMA Innovation Fund has provided funding to innovators leveraging mobile and digital technology to reach underserved people in low- and middle-income countries (LMICs).

Why do we focus on mobile and digital technology? When does putting a service on a mobile device, embedding an Internet of Things (IoT) sensor or developing a digital platform lead to improved livelihood, reduced barriers to essential or life-enhancing services or benefit the environment, and when is it a more expensive way to do something that could be done another way?

This paper answers that question by looking across the GSMA Innovation Fund portfolio rather than at any single grantee. The central finding is that mobile and digital technology rarely create better socio-economic outcomes on their own.

What digital technology does achieve is making services more deliverable, scalable and verifiable by lowering the cost of reaching people, improving the reliability of the services, ensuring inclusion and producing the evidence that funders, partners and regulators need to keep the business model alive.

Key findings

WHERE digital sits

Across the portfolio, digital is most often embedded directly in service delivery – IoT-enabled devices, apps, USSD, automation and sensor monitoring not confined to communications. It also creates system-level capabilities for scale (standardised, remotely managed processes) and value creation (traceability and monitoring that unlock carbon credits, plastic credits, compliance and premium markets).

HOW digital drives impact

The impact of digital technology is four-fold:

1) it widens reach and inclusion through multi-channel design (apps, USSD, IVR, SMS);
2) it improves efficiency and reliability through automation and real-time monitoring;
3) it builds trust and enables verification through transparency and audit trails; and
4) it improves affordability through digital payments and pay-as-you-go (PAYG) services. None of these works on digital alone; human interaction remains essential to adoption.

WHAT impact is evidenced

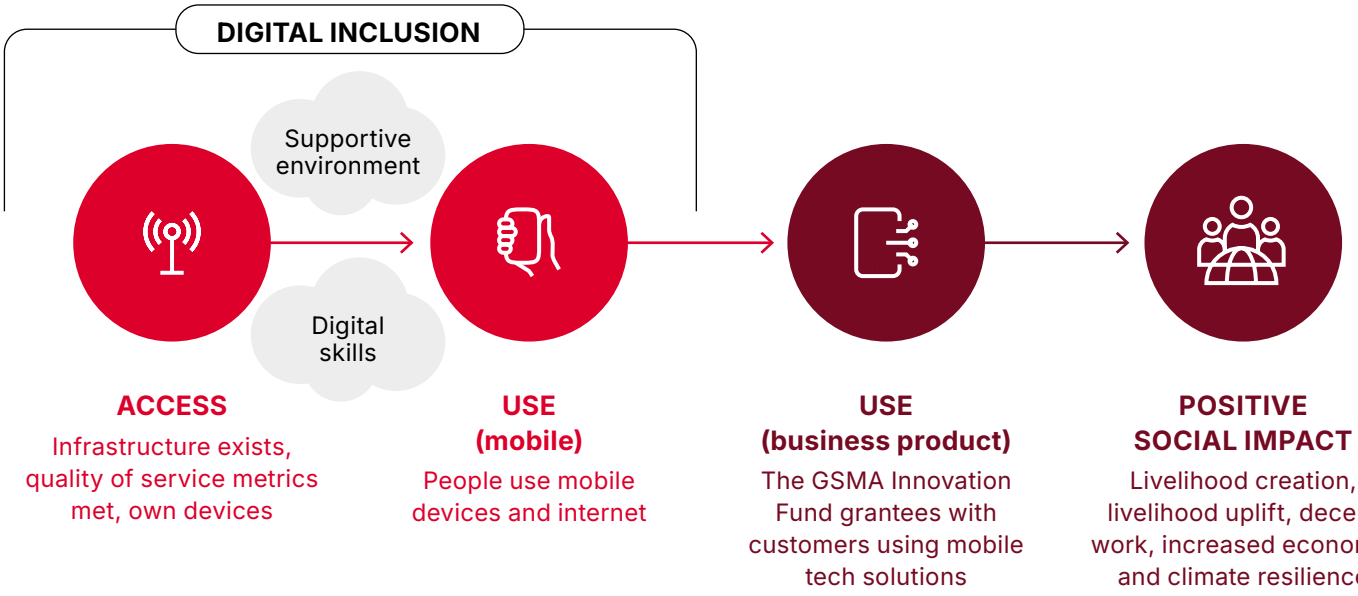
The evidence is strongest at the output and outcome level: better access and affordability, improved reliability and service quality, time and productivity gains and clearer environmental outcomes where verification systems exist. Deeper socio-economic change is plausible and supported by wider GSMA research, but it cannot be established off digital data alone; independent evaluation is still required.

1. INTRODUCTION



Developing and scaling mobile and digital technology have become a default in development programming. Services that once required an office, a paper ledger or a field visit are increasingly delivered through mobile handsets, sensors or cloud platforms. Yet the link between adopting a digital tool and improving someone's life is rarely direct. Mobile and digital technology works mostly by lowering barriers to access, information, payments and trust, and by reshaping how, where and at what cost a service can be delivered. The socio-economic gains that follow are real, but they are downstream, interwoven with many other factors and easy to overstate.

Figure 1: Pathway for digital solutions to lead to socio-economic impact



The GSMA Innovation Fund provides a unique evidence base for understanding where mobile and digital technology adds value, how it contributes to development outcomes and the conditions required for those benefits to reach end users. Since 2013, more than 150 companies have received funding from the GSMA to de-risk innovations leveraging this technology in LMICs. Funding is provided alongside technical assistance and support to develop partnerships with other ecosystem players, including mobile network operators (MNOs).

In total, we have dispersed more than USD 28 million in grants, supported our grantees to form 110 partnerships with MNOs and the innovations we've funded have impacted more than 104 million individuals. Collectively, grantees funded by the GSMA have gone on to secure USD 684 million in additional funding. Our research and monitoring and evaluation initiatives have generated insights into the long-term outcomes of these innovations on financial resilience, quality of life and commercial scale.

This paper steps back from individual success stories to answer a critical question for the industry: across many different solutions and sectors, where does mobile and digital technology genuinely add value, by what mechanism and under what conditions? For grantee-specific information, we invite you to visit the GSMA Innovation Fund digital portfolio.

This paper is intended to provide a practical lens for three audiences. For programme designers and implementers, it offers a way to test whether a digital component has a clear job to do. For funders and investors, it offers a framework for scrutinising the contribution of a mobile or digital technology in a development intervention and funding decisions. For policymakers and ecosystem actors, it highlights the infrastructure, inclusion and governance conditions that determine whether mobile and digital solutions have the right enablers to succeed.

In total, we have dispersed more than

USD 28 MILLION IN GRANTS

The innovations we've funded have impacted more than

104 MILLION PEOPLE

2. METHODOLOGY AND ANALYSIS FRAMEWORK



This paper draws from a mixed-methods evidence base assembled across a portfolio of 17 GSMA Innovation Fund grantees that were focusing on digital urban services and climate resilience:

- **Document and data review** of grantees' mixed-methods impact assessments of end users, key performance indicators (KPIs) (including operational metrics, such as usage) and interviews with founders and senior leaders about scale, mapping the digital touchpoints in each model.
- **Cross-case synthesis** of how digital technology intervenes, what it enables and the resulting impact.
- **Prior socio-economic research** by the GSMA on grantees, which provide user-level evidence on who benefits, how, and under what market conditions. These studies include:
  - Innovation Fund Investment Inclusivity (IFII) study: Conducted in 2025, the study looks at four grantees – TaskMoby in Ethiopia, Lumkani in South Africa, Ensibuuko in Uganda and GeoKrishi in Nepal – to understand the GSMA Innovation Fund's contribution to socio-economic impact across various contexts and intervention types. The study uncovers the role of digital technology in creating impact, and shows how services build critical resilience for users, supporting financial and climate resilience and improved livelihoods.
  - Pakistan Market Analysis: Conducted in 2026, the study explores how digital innovation is creating impact for underserved and economically vulnerable communities across Pakistan, while examining the market conditions enabling this progress. Drawing on insights from three grantees – DeafTawk, Orenda and Vceela – the report highlights how they are improving livelihoods, expanding economic opportunities and strengthening resilience.
  - Scaling and Impact Learning Paper: Conducted in 2025, this study explores the relationship between commercial scale and impact, the extent to which GSMA Innovation Fund grantees maintain, evolve or deprioritise products that serve the economically vulnerable as they grow and the business models and strategies that best support inclusion.

To compare very different innovations on a level footing, the paper uses a three-part framework. It asks **where** along an innovation's pathway to socio-economic impact digital technology intervenes, **how** it drives change and **what** impact can credibly be linked to it. It deliberately frames mobile and digital technology as an enabler – these tools open up possibilities, but whether those possibilities are realised depends on people, markets and infrastructure.

Dimension	Key question	What we look for
Where?	At which points in an innovation's impact pathway do mobile and digital technology intervene: service delivery, engagement, scaling, value creation?	A map of mobile/digital touchpoints across the model
How?	By what mechanism do mobile and digital technology drive impact: speed, reach, cost, personalisation, trust, verification?	The specific change mechanism and the process it improves
What?	What outcomes follow and what evidence supports a contribution claim (not attribution)?	Output and outcome evidence, risks and barriers

3. FINDINGS FROM THE GSMA INNOVATION FUND PORTFOLIO



This section summarises the key patterns and insights that emerge across the analysed portfolio. It is organised around the framework - where mobile and digital technology intervene, how it drives impact, what outcomes are evidenced and the enablers and constraints that determine whether any of it works in practice.

3.1 Where mobile and digital sit in impact pathways[1]

An analysis of select GSMA Innovation Fund grantees' impact pathways identified four recurring touchpoints across the portfolio. These touchpoints are not mutually exclusive and the strongest grantee models combine several of them.

Service delivery	Mobile and digital technology are embedded in the product itself – IoT devices, apps, USSD menus, automation, sensors – so that it becomes the mechanism that makes a service reliable, trackable and deliverable at a low marginal cost. This is the most common entry point.
Stakeholder engagement	Apps, USSD, IVR, SMS, digital marketing and in-app feedback connect users, agents, implementers and partners, supporting onboarding, reminders, two-way feedback and behaviour change.
Standardisation	APIs, cloud automation, modular hardware-software stacks and MNO integrations lower the marginal cost of growth and allow remote management across geographies.
Monitoring	Monitoring, reporting and verification (MRV) and traceability turn activity into verifiable assets such as carbon and plastic credits, regulatory compliance, buyer due diligence and underpin PAYG and digital finance. This is where mobile and digital technology can change the business model itself, not just the delivery of a service.

The synthesis found that 100% of grantees used three to four of these touchpoints:

- All grantees (100%) whose impact pathways were analysed used mobile technology for service delivery.
- All grantees (100%) leveraged mobile technology as a tool for engaging stakeholders.
- All grantees (100%) relied on standardised processes, digital platforms and technology as key enablers of scale.
- Nearly half (41%) of grantees analysed used mobile technology to make their activities visible, traceable and verifiable.

The clearest pattern is that mobile is rarely used simply as a communications add-on. In the most effective business models, it is embedded directly into how the service itself is delivered. Connected devices, automated sensors and integrated management systems are not tools that support the service – they are the service. Digital infrastructure becomes the mechanism through which the product functions, is monitored and is maintained.

All four touchpoints appear consistently, whether an innovation delivers clean cooking, safe water, sanitation, circular economy, agriculture and climate resilience or financial inclusion. Mobile and digital technology tends to sit not at one point but across the entire impact pathway. While the underlying role of the technology is consistent, its emphasis and mechanism vary by sector and grantee business model: verification is most pronounced in waste and energy where credits and compliance depend on it, reach and engagement dominate in agriculture and climate resilience, and reliability through service delivery is central in water and sanitation.

Reaching low-income users rarely depends on the most advanced technology. Much of the analysed portfolio's inclusion comes from low-tech channels that include USSD menus, interactive voice response (IVR) and SMS and feature phone access and is often in local languages. These simpler mechanisms allow a service to work without access to smartphones, data plans or strong connectivity, enabling tech-based solutions to extend to low-literacy and feature phone users that would otherwise be excluded by app-only models.

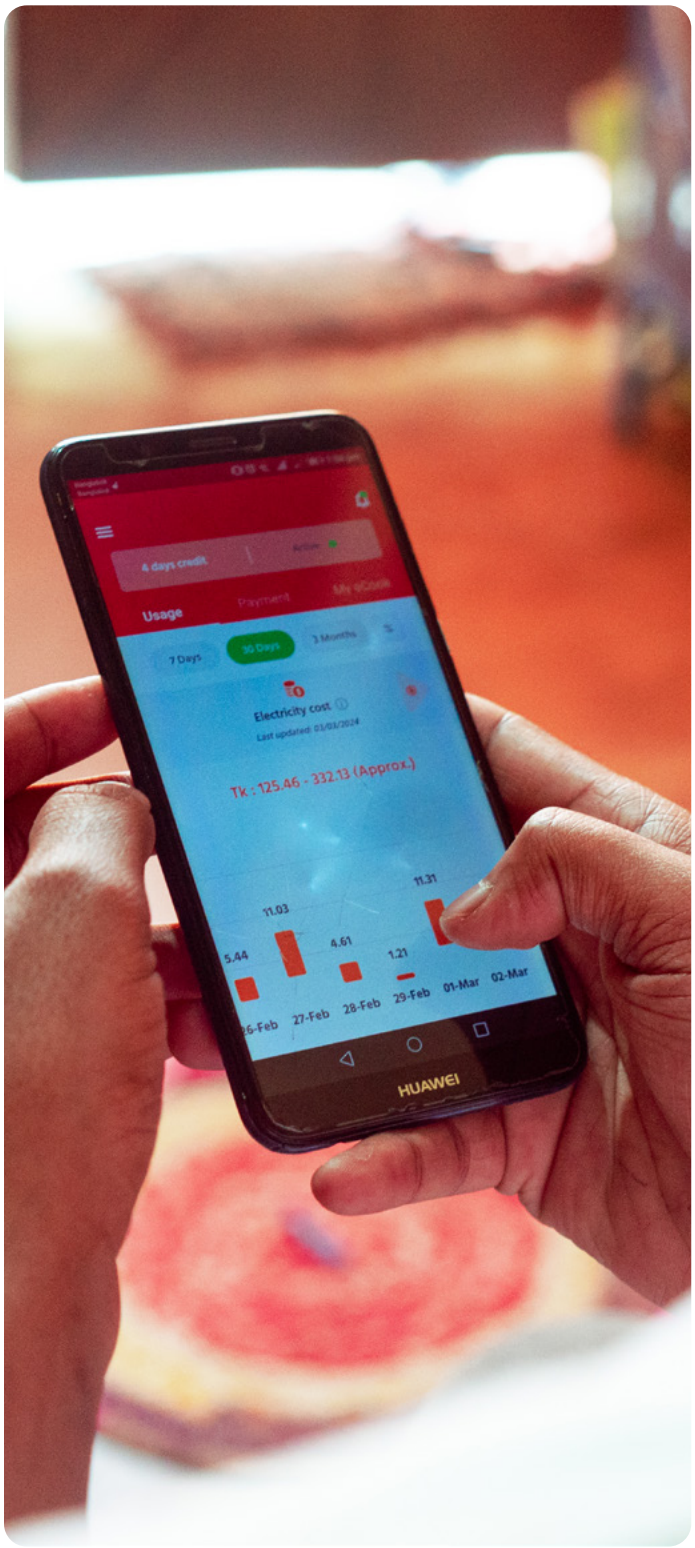
1 The four touchpoints – service delivery, stakeholder engagement, standardisation and monitoring – are an analytical synthesis of 17 GSMA Innovation Fund grantees. They were identified by mapping the digital components of each model across the portfolio, drawing on documentation of the grant funded innovations' impact pathways, endline reports and KPI data.

ATEC

Clean cooking / Energy **Bangladesh**

Illustrates: PAYG affordability and automated MRV enabling carbon credit value creation and scale.

ATEC's eCook is a PAYG, IoT-connected electric cookstove that helps low-income households shift from biomass to cleaner cooking with a lower upfront cost. Digital technology runs the full length of its' impact pathway, from how the stove is paid for to how its climate impact is monetised.[2]



Where?

- An IoT, SIM-connected stove paired with a mobile app showing real-time electricity use, payment status and carbon-offset data
- Embedded mobile money payments
- Automated, Gold Standard-compliant monitoring, reporting and verification (MRV system)

How?

- PAYG lowers the cost of entry by allowing users to make affordable monthly payments towards full acquisition of the eCook stove.
- The mobile app reduces the customer service burden through self-service issue reporting. Automatic metering generates verifiable usage data that mints carbon credits in real time.
- SIM-enabled devices and a replicable software platform can be deployed across geographies to support in scaling.

What?

- High app usage (around 92%)
- Strong sales growth driven by digital marketing
- Carbon revenue (a large-scale credit purchase agreement) helps subsidise user payments and improve affordability
- A digital backbone lowers the marginal cost of expansion

Takeaway: Digital is the engine of the business model, not just the service. Carbon finance is only possible because usage is automatically and credibly verified.

2 ATEC theory of change synthesis. See: GSMA. (2024). ATEC Innovation Fund grant report.

Mobile also builds system-level machinery for scale. When processes are standardised and can be managed remotely, and when systems are built with integration in mind (through APIs and shared platforms), a model becomes easier to replicate in new locations or contexts without having to be rebuilt from scratch each time. This turns operational infrastructure into a foundation for growth, rather than a constraint.

BaKhabar Kissan (BKK)

Agriculture / Climate resilience **Pakistan**

Illustrates: Standardised, remotely managed systems and MNO integration, turning operational infrastructure into a foundation for scale.

BKK is a weather and agronomic advisory service currently reaching millions of farmers in Pakistan and carrying a new risk-management service on the same infrastructure.[3] This growth came from standardising and automating the model rather than rebuilding it in each new place.[4]

Where?

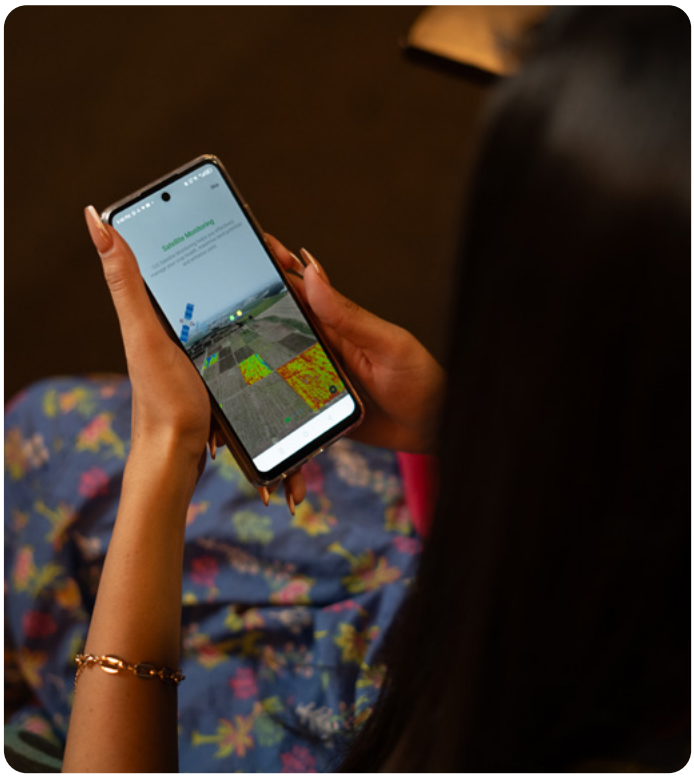
- Automated weather stations (AWS) feeding hyperlocal data delivered through mobile.
- An IVR line with automatic speech recognition, a mobile app and SMS/robocall channels for delivery
- A cloud-based Agri Risk Management (ARM) system for pest and disease alerts through mobile
- Value-added -service and MNO integrations that make the service available across networks.

How?

- Digital onboarding, simplified user forms and automated data flows enable mass acquisition without proportional field effort.
- MNO and VAS integration make the service available cross-network with automation rather than rebuilds by each operator.
- Cloud-based ARM alerts scale across geographies with no physical presence (this is a new service layered onto the existing advisory using the same platform).

What?

- More than 6 million new users (more than three times the target) acquired cost-effectively through automation rather than physical outreach
- A new pest/disease alerting service added to the existing infrastructure
- Downstream outcomes among users (91% improved yields, 87.5% increased income, 94% adopted weather advisories)

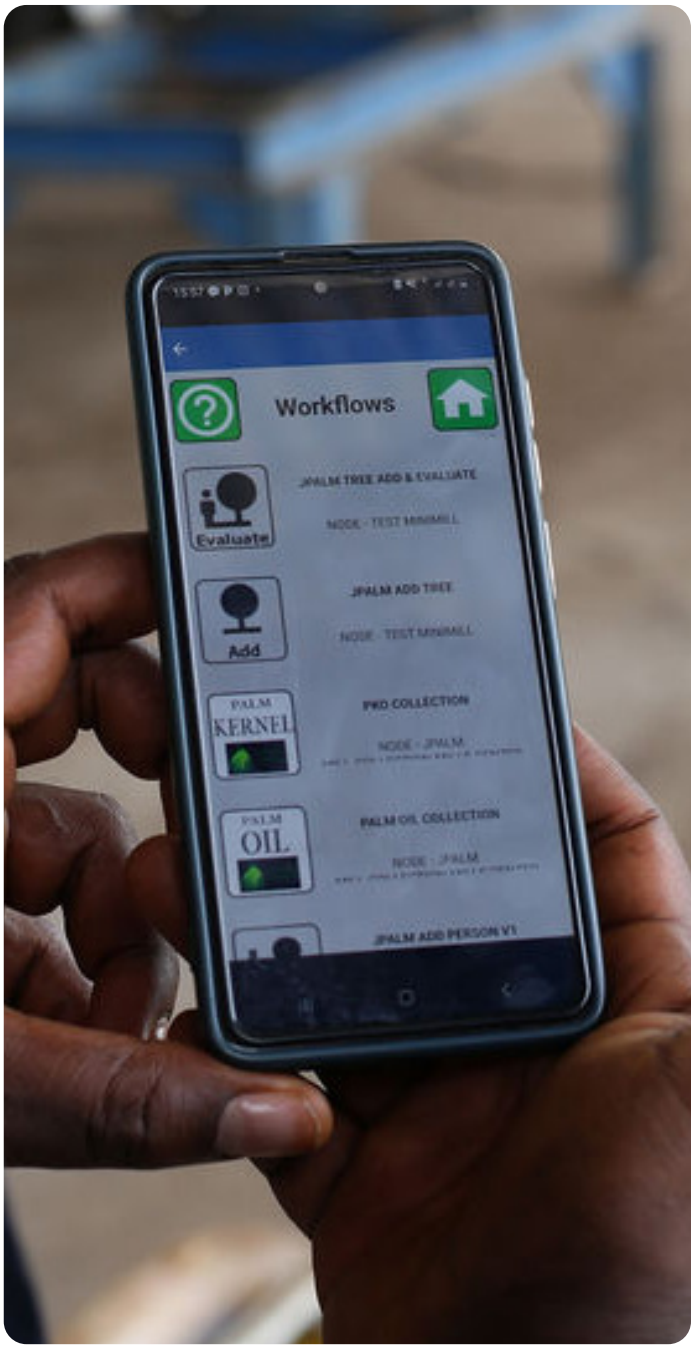


The reality of scaling through market replication[5]

Replication to new markets has often proved expensive and difficult. Products must be adapted to local languages and use cases, and new markets often lack on-the-ground partners. Several grantees found growth constrained less by their technology than by the cost of localising it and the absence of distribution partners. Where replication did accelerate, it usually relied on standardisation plus a specific enabler - an integrator, an MNO partnership, or a white-label / software-as-a service (SaaS) route that let others run the platform. Mobile and digital technology lowers the marginal cost of growth; it does not remove the human and market cost of entering a new place.

3 BKK theory of change synthesis. See: GSMA. (2024). BKK Innovation Fund grant report.
4 BKK theory of change synthesis. See: GSMA. (2024). BKK Innovation Fund grant report.
5 GSMA. (2025). Scaling and impact learning paper.

Lastly, mobile and digital technology enables Monitoring, Reporting and Verification (MRV) and traceability. The same tools that can support day-to-day operations also generate verifiable data that can substantiate claims to third parties, whether for compliance, certification or payment. In effect, digitally generated records of activity can be converted into recognised forms of value beyond the original service itself, opening new revenue streams or partnership opportunities.



J-Palm

Agriculture / Sustainability **Liberia**

Illustrates: Digitally generated traceability records converted into recognised proof of sustainable sourcing that help unlock certification, buyer confidence and new revenue streams beyond the original operational purpose.

J-Palm is a Liberian agribusiness working with smallholder palm harvesters to improve the sustainability, productivity and commercial viability of wild harvest palm oil. Alongside introducing mini-mills to improve processing efficiency, J-Palm developed a mobile blockchain-enabled traceability system that records the movement of palm products through the supply chain and creates a verifiable chain of custody.[6]

What?

- A mobile blockchain traceability app used by agents to record each palm oil and palm kernel purchase, from harvester to processed product
- Mobile-based tree mapping and forest-health monitoring, capturing geospatial data on plantation coverage, deforestation risk and carbon storage potential
- Mobile money payments to harvesters linked to the same transaction records generated for traceability

Where?

- Transactions are captured digitally at the point of purchase, creating a time-stamped, georeferenced and tamper-resistant record.
- Traceability and tree-mapping data are available for regenerative agriculture certification.

How?

- J-Palm secured a regenerative agriculture certification and won new commercial contracts.
- 100% of surveyed farmers reported that their income had increased or stabilised, supported by both the mini-mills and the premium, traceable market access the app enabled. Takeaway: Mobile and digital technology created value not simply by improving operations, but by making sustainability and sourcing practices visible, verifiable and transferable to third parties.

Takeaway: Mobile and digital technology created value not simply by improving operations, but by making sustainability and sourcing practices visible, verifiable and transferable to third parties.

6 J-Palm impact pathway synthesis. See: GSMA. (2025). J-Palm Innovation Fund grant report.

3.2 How mobile and digital technology drive impact

Beneath the four touchpoints, a handful of mechanisms are critical to generating medium- and long-term impact.



Reach and inclusion

Multi-channel design (apps, USSD/IVR/SMS) extends services to people that geography, cost or literacy would otherwise exclude.



Efficiency and reliability

Automation and real-time monitoring cut downtime, losses and manual workload and speed up issue resolution. These benefits accrue primarily to providers, and the extent to which they translate into user-facing reliability varies by sector. In utilities and water, for example, the link is relatively direct, with remote monitoring improving service reliability. In most other sectors, however, the bulk of the impact sits with providers' operational efficiency; any benefit to marginalised or vulnerable users (through lower costs or more reliable service) is indirect and difficult to evidence.



Transparency, trust and verification

Data synthesised from the sampled grantees indicates that audit trails and traceability raise confidence among users, funders and partners, and make compliance and monetisation possible.



Affordability

Digital payments and PAYG enable instalments and reduce the friction and risk of handling cash.



Reach and inclusion

The strongest evidence of effective reach comes not from any single channel, but from deliberately combining multiple channels to meet users where they are. Pairing smartphone apps with USSD, SMS and IVR delivered in local languages[7] allows services to remain accessible to users with feature phones, limited digital literacy or lower comfort with app-based interfaces. This kind of multi-channel design recognises that different user groups engage with technology differently, as preferences can vary by gender,[8] age, income or prior exposure to digital tools, and a single channel rarely serves all of them equally well. The IFII study in 2025 found that 32% of TaskMoby users in Ethiopia accessed their platform online or through an app while 48% engaged through USSD, call centres or agents, signalling that multi-channel approaches are better for strengthening reach and inclusion.

Multi-channel design creates genuine choice for users to interact in the way that suits them best. Digital solutions designed only around smartphones or app-based interfaces tend to reach those who are already better connected and better resourced, reinforcing existing inequalities rather than alleviating them.

7 GSMA. (2024). See: CoAmana Innovation Fund grant report.
8 GSMA. (2024). See: CoAmana Innovation Fund grant report.

GeoKrishi

Agriculture / Climate resilience **Nepal**

Illustrates: A digital advisory platform within a human-mediated delivery model, driving inclusive last-mile reach.

GeoKrishi delivers climate-smart agricultural advice to smallholder farmers through a mobile and web platform. Its distinguishing feature is not the app itself but how the app sits within a network of cooperatives, facilitators and community centres, showcasing how digital and human delivery can work together.[9]

Where?

- A mobile/web platform providing climate-smart advisories, real-time weather, market prices and image-based crop health diagnostics
- SMS and data-pack channels for feature phone users
- System dashboards, geotagging and promo codes for monitoring and learning

How?

- Translates climate and agronomic data into localised, actionable advice across the crop cycle, with two-way expert feedback on submitted crop photos within 24 hours.
- Facilitators and women-led cooperatives register, onboard and train farmers so the technology reaches people who would not adopt an app on their own.

What?

- 51,591 direct users, 57% of them women
- Expansion to more than 35 municipalities and 80 downstream partners
- Among climate-smart adopters, 95% report increased yields and 92% increased income Takeaway: Reach and inclusion came not from the digital platform itself but by pairing it with people. Together, the multi-channel design (app plus SMS and data packs) and human delivery model reached women and farmers using feature phones rather than those who were already connected.

Takeaway: Digital is the engine of the business model, not just the service. Carbon finance is only possible because usage is automatically and credibly verified.



Reach has a flip side: the risk of leaving people behind

Wider reach is not automatically more inclusive. The need to own a smartphone, to be digitally literate or to use mobile money can quietly exclude the very people a programme most wants to serve – often women, older users and the poorest. Existing evidence from grantees clearly highlights this: Innovation Fund solutions tend to reach users from lower income groups but not those from the lowest socioeconomic quintile,[10] who sit just below the threshold of digital access.

9 GeoKrishi theory of change synthesis. See: GSMA. (2024). GeoKrishi Innovation Fund grant report.
10 GSMA. (2025). Innovation Fund Investment Inclusivity



Efficiency and reliability

The clearest evidence of digital impact is often seen in day-to-day operations. By automating processes and enabling real-time monitoring, mobile and digital tools help service providers identify and address issues more quickly, allocate resources more effectively and make more informed operational decisions. Across the utilities cases in particular, this shows up in this shows up in measurable gains. Diyalo's remote monitoring and automation cut reservoir overflow by around 90% and reduced the receivable-collection period by roughly 10 days, while JanaJal used continuous operational data to optimise delivery routes and respond to fuel-price shocks.

These capabilities can reduce inefficiencies, strengthen financial management, streamline customer support and improve responsiveness to changing conditions. Over time, this helps providers deliver more consistent and reliable services while operating more sustainably.

Operational efficiencies generated through digitalisation do not only benefit providers; they can also contribute to a better customer experience and greater trust in the service being offered.

Diyalo (WaterMark)

Water utilities / WASH Nepal

Illustrates: IoT automation and enterprise resource planning/customer relationship management (ERP/CRM) enabling reliability, transparency and operational efficiency.

In Nepal, only about half the population has piped water at home and fewer than a third of water schemes are fully functional. Diyalo's WaterMark gives utilities the digital tools to run better, with knock-on benefits for households.[11]

Where?

- IoT sensors, pump automation and level monitoring
- ERP/CRM and enterprise dashboard for utilities
- A customer app for digital billing, payments, meter readings and complaints

How?

- Automates monitoring and pump control, digitises billing and complaint management and gives utility staff real-time dashboards for evidence-based decisions
- SMS and app notifications keep customers informed

What?

- Reservoir overflow cut by around 90%
- Receivable-collection period reduced by 10 days
- Revenue collection up 14% where payments moved fully online.
- ~12% average operations and maintenance cost savings reported
- Rapid scale from 175 to more than 800 utilities (around 1.5 million households)

Takeaway: While the user-facing benefit is indirect, the digital case rests on operational efficiency and reliability at the provider level. The end user gains access to a more dependable and safer service.



Speed, reach and cost reductions are real, but they are not free or universal. Compute, server capacity and the skilled staff needed to build and run these systems are expensive. Businesses need to recoup these costs, often by passing them on to users. The same mechanisms that widen reach and speed can also raise the cost per unit to a point where the service becomes out of reach for low-income users, leaving the most vulnerable behind.

11 Diyalo theory of change synthesis. See: GSMA. (2024). Diyalo Innovation Fund grant report.



Transparency, trust and verification

Across the models reviewed, digital transparency emerges repeatedly as a source of value that extends well beyond simple record-keeping. When transactions, activities or outcomes are tracked and recorded digitally, they create a verifiable history that can be trusted not only by the users generating it, but by external parties that were not present to observe it directly. For end users, this verifiable record reduces room for fraud or disputes, builds trust among users themselves and, most importantly, becomes a form of evidence that users and providers can present as proof of reliability or performance.

This capability tends to unlock relationships that would otherwise be difficult to establish. For users, a digital history of financial behaviour can substitute for the collateral or track record that formal institutions normally require, allowing users to access credit or services previously out of reach. For instance, Ensibuuko's digital ledger served as proof of financial stability that let savings groups secure formal bank loans.12 A synthesis of grantee-specific information and the 2025 GSMA IFII study found that digitalisation of village, savings and loans associations (VSLAs) increased trust and confidence among group members through greater transparency, better record-keeping and verification.

Similarly, for service providers, digitally verified data on environmental or operational outcomes can give corporate or institutional partners the confidence to enter into compliance arrangements, certification schemes or long-term commercial commitments that depend on verifiable evidence.

Ensibuuko

Financial services / Financial inclusion
Uganda

Illustrates: A digital transaction record that substitutes for collateral, unlocking formal credit that users could not otherwise reach.

Ensibuuko digitises the savings and lending activities of VSLAs and cooperatives. Digital records create trust and provide a verifiable history that a bank or other formal financial institutions will accept as proof of how a group or individuals manage their money.[12]

Where?

- A mobile app and USSD platform record each group's savings, loans and transactions in a shared digital ledger, with member-level histories, automated payment reminders and access controls.

How?

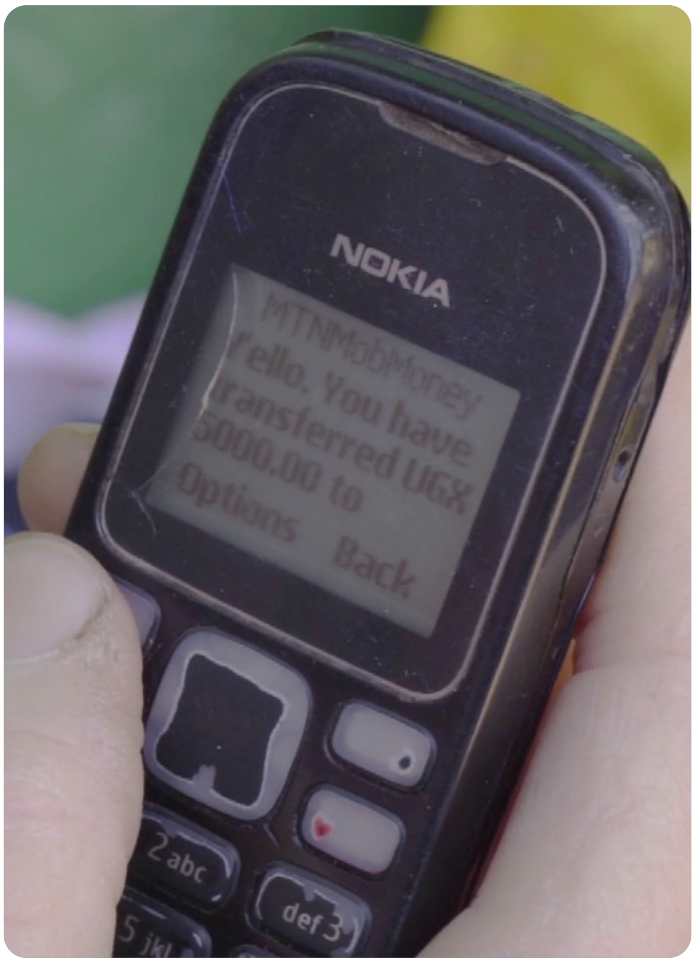
- Every transaction is captured digitally, creating a tamper-resistant record that all group members can see. This transparency reduces fraud and mismanagement and builds trust between members.
- The records serve as proof of financial stability that a group or individual can present to a formal lender in place of the collateral or track record a bank would normally demand.

What?

- 89% of socio-economic survey respondents indicate Ensibuuko's digital credit history increased their chances of accessing loans and 92% said the app improved their access to savings or loans. 90% said it helped them start or grow a business.
- Groups used their ledger to secure formal bank loans, reducing reliance on high-interest informal lending, and reported greater trust and reduced fraud within the group.

Takeaway: By making a group's financial behaviour verifiable to an outside institution, Ensibuuko unlocks credit relationships that paper records could not.

Ensibuuko



Verification has limits

Digital verification establishes outputs – a stove was used, plastics were collected, digital payments cleared. It does not, by itself, establish socio-economic impact. That a business model is digitally verified does not make it commercially self-sustaining either: many grantees remain grant-dependent despite excellent data systems. MRV and traceability are powerful tools for partner confidence and monetisation but do not serve as a basis of whether lives are actually improved.

12 GSMA. (2025). Innovation Fund Investment Inclusivity



Affordability

Digital payment mechanisms, particularly PAYG models, change the affordability equation for users who would otherwise be excluded by high upfront costs.[13] By breaking payments into smaller, manageable instalments and enforcing repayment digitally, providers can extend access to essential services or equipment to users who could not otherwise afford them outright, while still maintaining low default rates through automated, nonpunitive enforcement mechanisms rather than manual collection or costly recovery processes. Koolboks illustrates this clearly: its PAYG model lets small businesses pay for solar refrigeration in instalments, with cooling paused digitally if payment lapses.

Beyond affordability, the shift to digital payments also tends to draw users into the formal financial system for the first time, introducing them to mobile money[14] or digital transaction tools they had not used previously. A 2020 GSMA study found that up to 31% of PAYG solar customers were new to mobile money or reactivated their once dormant accounts, this has value that extends beyond the immediate service being purchased; it builds familiarity and trust in digital financial tools, which can open the door to other financial services over time.

For providers, the same shift generates operational benefits that reinforce these user-facing gains. Digital payments create clearer, more traceable revenue streams, reduce the costs and leakages associated with cash handling and improve visibility into who is paying, when, and how consistently. This combination of improved affordability for users and transparency and reliability for providers is what makes digital payments a recurring source of value that simultaneously lowers the barrier to entry and strengthens the financial sustainability of the service itself.

13 World Bank. (2024). ESMAP (Energy Sector Management Assistance Program), "Affordability of Off-Grid Solar," Off-Grid Solar Market Trends Report
14 GSMA. (2020). The Value of Pay-as-you-go Solar for Mobile Operators.

Koolboks

Refrigeration / Energy
Nigeria (expanding across Africa)

Illustrates: Pay-as-you-go digital payments making equipment affordable while drawing users into digital finance.

Koolboks is a Nigeria startup that provides solar-powered cooling solutions to small businesses through PAYG. Customers pay in small, regular instalments and digital technology enables remote control of the units to enforce regular payments.[15]

Where?

- PAYG technology remotely switches the freezer's cooling on and off based on payment.
- Monthly digital tokens unlock each instalment
- A platform for onboarding, digital identity checks and credit management
- Mobile money and virtual account payments through MNOs and fintech partners

How?

- Breaking a large upfront cost into manageable instalments puts the equipment within reach of small businesses that could never pay in full.
- Repayment is enforced digitally by pausing the cooling system if payment lapses and resumes when it is made.
- For many customers, paying this way is their first experience with mobile money and formal digital finance.

What?

- Exceeded user targets (103%) with reliable refrigeration reaching small traders in off-grid areas
- Low default rates kept (around 3%, with portfolio-at-risk as low as 0.3%) through automated, non-punitive enforcement
- Many first-time digital payers brought into the financial system will lead to greater benefits with continued use

Takeaway: PAYG lowers the barrier to entry for users who could not pay upfront and gives the provider dependable, visible income without costly manual collection.



The human factor: technology rarely sells or retains on its own

Across end user-facing Innovation Fund grantees, none could rely on digital alone for sales, onboarding or retention. Many users still prefer to deal with a trusted field agent rather than an app because they are less digitally literate, or because they trust a person more than a screen. Every successful model paired its technology with people: agents, training, referral and a human point of contact. Digital reduces the cost of human touch; it does not remove the need for it.

15 Koolboks theory of change synthesis. See: GSMA. (2024). Koolboks Innovation Fund grant report.

3.3 What outcomes do we see?

Across the portfolio, the medium-term outcomes that recur with the strongest evidence for end users of mobile and digital technology are:

- **Increased access to services**

  Digital payments, PAYG models and simplified user journeys bring people who were previously outside formal systems into a service for the first time. SaaS is also less expensive to run than in-person engagements, making it cheaper and easier for companies to reach people in remote areas. End users frequently report first-time access to the services provided by grantees, especially in low-income and remote areas. 84% of GeoKrishi users were accessing a service like this for the first time,[16] and up to 70% of Ensibuuko's VSLA users had never accessed a similar service.[17]

- **Increased access to information**

  SMS, IVR and app-based information sharing enables phone users to communicate with agricultural, health and education experts, often in their native language, without the need to travel. The BKK weather and agronomic advisory service expanded reach to more than 6 million farmers in Pakistan via IVR and USSD.[18] This is especially beneficial for individuals who cannot take time away from childcare duties, farmwork or income-generating activities to seek advisory services.

- **Enhanced service quality and reliability**

  Monitoring, automation and faster issue detection and resolution improve the reliability, consistency and dependability of services, particularly in business models where service interruptions have a direct impact on users' daily lives. Real-time data and remote management let service providers spot and fix problems before users are affected. A clear illustration of this is Diyalo's remote monitoring and pump automation that cut reservoir overflow by around 90% and lowered running costs by roughly 12%.[19] Layered on top of a digital tool, many end users report improved experiences when compared to other, non-digital, engagement.

All these outcomes are further strengthened when **inclusion** is also present. When digital tools and the business models that distribute them are deliberately designed to reach vulnerable groups, they can meaningfully expand reach. This includes women, such as through women-led networks, female facilitators or tailored user journeys, as well as low-income individuals, users that struggle with digital literacy and persons with disabilities.

Zonful Energy

PAYG Solar and Smartphones **Zimbabwe**

With their GSMA Innovation Fund grant, Zonful[20] sought to put affordable smartphones and internet in the hands of rural, off-grid households so they could use the company's pay-as-you-go energy service. They built a network of sales agents to provide digital skills clinics and roadshows so potential customers could learn about the value and relevance of smartphones and solar energy. Of the more than 10,000 participants, 78% were women, yet women were significantly under-represented when it came to actual sales and usage - female beneficiaries and active users fell short of targets by 55% and 26%, respectively.

Zonful dug deeper with market research to better understand the barriers to women's uptake and realised the reason women didn't want mobile phones was because when the men left the house, they took the internet with them. Zonful responded by bundling the solar home system with a satellite dish and fixed internet access - so that internet connectivity would stay home regardless of who came and went.

Zonful's business analyses had not only led to a stronger focus on women customers, but also on women as sales agents. They rebranded its salespeople as 'female micro-entrepreneurs', equipped them with container offices and smart tablets, and relies on them for facilitating roadshows and onboarding customers. Now 65% of their sales agents are women and the percentage of female customers has risen significantly.

16 GSMA. (2025) Innovation Fund Investment Inclusivity.
17 GSMA. (2025) Innovation Fund Investment Inclusivity.
18 BKK Innovation Fund grant report (2024)
19 Diyalo Innovation Fund grant report (2024)
20 GSMA. (2026). Zonful case study.

In the longer term, two key outcomes of successful mobile and digital technology implementation are evident:

- **Financial resilience**

  Through new and improved access to services and information, many of the Innovation Fund grantees have generated long-term impact through building financial resilience among their end users. This is evidenced through their end-users' increased ability to absorb economic shocks, improved financial security and income generation. Findings from the 2025 IFII research showed that 92% of Ensibuuko users in Uganda reported better management of savings and loans, as well as Ensibuuko enabling them to start or grow their businesses. In Nepal, 78% of GeoKrishi users surveyed indicated that their household income stability has improved and 64% reported improved resilience to economic shocks.

- **Quality of life**

  By accessing digital services, GSMA Innovation Fund grantees have increased end user autonomy, confidence and skillsets. For users with hearing impairments in Pakistan, DeafTawk's mobile-enabled interpretation services reduced reliance on family members for communication, with 87% reporting greater independence and 76% reporting increased confidence when communicating.[21] In Pakistan's under-resourced school systems, Orenda's Taleemabad digital education system leverages mobile and AI technologies to strengthen teaching and learning, with 86% of teachers and educators reporting better support and improved student educational outcomes.[22] The diversity in evidence leads back to general quality-of-life improvements reported by end users across LMICs.

Additionally, mobile and digital technology have clear potential to support **environmental outcomes**. These would be clearest where digital verification exists to substantiate these outcomes, such as tracked diversion of waste from landfill, monitored energy recovery or estimated emissions reductions from cleaner alternatives to traditional practices. Across the portfolio, there is clear evidence of capability, that digital systems can track, monitor and verify these outcomes. Verification is what will allow these outcomes to be credible rather than assumed by ensuring integrity of the reported environmental outcomes. Verification can make the outcomes credible and turns it into a certifiable and tradeable asset, such as carbon credits or plastic credits, that can help fund the activity itself.



Crop2Cash, Nigeria

21 GSMA. (2026). Pakistan market report – DeafTawk case study.
22 GSMA. (2026). Pakistan market report – Orenda case study.

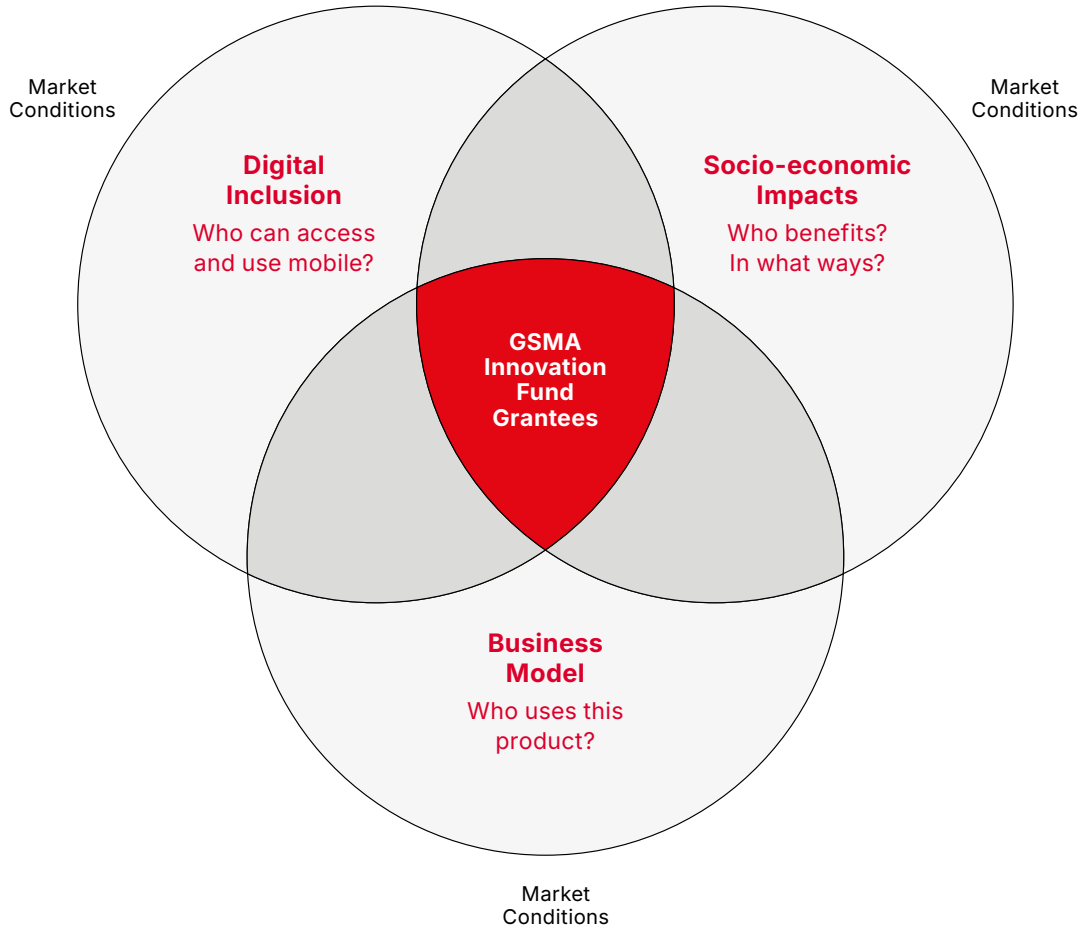


Diyalo, Nepal

3.4 Enablers and constraints that determine performance and scale

Whether a solution leveraging mobile and digital technology delivers depends not only on the functionality of its technology, but also on the conditions surrounding it.

Figure 2: GSMA Innovation Fund grantees intersect at inclusion, business model and impact



Four sets of factors stand out:

Factor	Why it determines performance and how grantees respond
Infrastructure and access	Connectivity, device affordability, power reliability and data costs set a ceiling on what digital solutions can achieve. Weak networks and unreliable power undermine data-intensive or real-time features, and digital design cannot substitute for infrastructure that does not exist. Mitigation measures: • **USSD/IVR fallbacks:** Providing menu or voice-based channels alongside apps ensures users without smartphones or reliable data can still access core services. • **Offline-first design:** Building systems to function without an active connection, then syncing data once connectivity is restored, prevents service disruption for users or field agents operating in low-connectivity areas. • **Zero-rating:** Partnering with MNOs to make specific apps or services accessible without consuming a user's data allowance removes cost as a barrier to access. • **Solar charging:** Integrating solar power reduces dependence on unreliable grid electricity, keeping devices operational and enabling continued digital access.
Human capability	Digital literacy, last-mile agent support and incentives for sustained use determine whether tools are adopted and become part of users' daily lives. Low digital literacy acted as a barrier across the portfolio, adding cost and requiring in-person touchpoints and repeated training. Mitigation measures: • **Simplified user experience (UX):** Icon-based or voice-guided interfaces reduce reliance on reading or prior digital experience. • **Local agent networks:** Trained field agents or community champions provide in-person onboarding, troubleshooting and ongoing support. • **Peer-to-peer learning:** Leveraging early adopters or community groups to model usage reduces dependence on formal training alone. • **Incentivised engagement:** Loyalty rewards, discounts or visible benefits for continued use help sustain adoption beyond the initial learning curve.
Ecosystem maturity	Beyond technology and user adoption, the viability of digital models is often shaped by external structural factors that individual providers have limited control over. Payment infrastructure, integration pathways and regulatory environments can either enable a model to scale efficiently or impose costs and delays that constrain its growth. Mitigation measures: • **Early regulatory engagement:** Proactively engaging regulators to clarify obligations and reduce compliance uncertainty. • **Policy advocacy/partnerships:** Working with industry bodies or peers to influence favourable regulatory conditions. • **Use of integrators/aggregators:** Leveraging third-party platforms (e.g. payment aggregators) to avoid costly per-operator integrations.
Governance and data integrity	Data quality, privacy, security and auditability are essential when revenue or compliance depends on verification. Mitigation measures: • **Data validation checks:** Automated flags for anomalies or inconsistencies at point of entry. • **Consent and privacy protocols:** Clear user consent processes aligned with data protection regulations. • **Encryption and access controls:** Protecting data with role-based permissions. • **Third-party certification:** Independent verification to build credibility with compliance bodies or buyers.

4. CONCLUSION



So, why mobile?

Mobile and digital technology contribute to development less by creating better socio-economic outcomes and more by making services deliverable, scalable and verifiable. It lowers the cost of reaching people, makes services more reliable and improves affordability through digital payments. Digital tools also produce the evidence that helps partners, funders and regulators trust and sustain a business model. In the best cases, it changes the business model itself by turning verified activity into carbon credits, compliance or premium market access.

However, technology is an enabler, not a guarantee. It works when it is embedded in service delivery with a clear job to do; when it is designed so that the poorest, most vulnerable and low-literacy users are included rather than left behind; when it is paired with the human contact that still drives adoption and trust; and when the surrounding ecosystem – connectivity, payments, partners and regulation – allows it to function. Where those conditions are absent, digital adds cost without contribution and can break the very impact pathway it was meant to enable.

For development partners, investing in inclusive channels, operational integration and verification-ready data systems will increase the likelihood that a mobile or digital intervention translates into measurable change.

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