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PROTOCOL: Advancing Agent Networks and Merchant Payments for Financial Inclusion in Low- and Middle-Income Countries (LMICs): An Evidence and Gap Map

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Abstract

This Evidence and Gap Map (EGM) protocol aims to systematically identify, map, and synthesize the existing evidence on supply-side interventions that strengthen agent networks and merchant payment systems for advancing financial inclusion in low- and middle-income countries (LMICs). Specifically, the EGM will: (1) identify clusters of evidence that present opportunities for further evidence synthesis, including systematic reviews, and (2) highlight critical evidence gaps where additional primary research and evaluations are needed. By organizing evidence across intervention types, outcome domains, and study designs, the EGM will provide a comprehensive and accessible overview of what is known about the development of agent networks and merchant payment ecosystems. The findings will support evidence-informed decision-making by policymakers, regulators, funders, and practitioners seeking to strengthen inclusive and resilient digital financial service delivery systems in LMICs.

Keywords: agent networks, merchant payments, financial inclusion, low- and middle-income countries, evidence and gap map

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Background

Introduction

The Problem, Condition or Issue

In low- and middle-income countries (LMICs), mobile money and other digital financial services (DFS) have become vital instruments for promoting financial inclusion. They have expanded access to payments, savings, credit, and insurance for women, low-income households, small and medium enterprises (SMEs), and informal businesses that are often excluded from traditional banking systems (Annan et al., 2022; Demirgüç-Kunt et al., 2022; Suri, 2017). Agent networks and merchant payment lie at the heart of this expansion, serving as the operational infrastructure through which digital finance reaches users and becomes usable in everyday life. Agents and merchants expand access points, enable cash-in and cash-out transactions, facilitate bill payments and remittances, and support routine digital transactions in local communities where formal financial institutions are absent or difficult to access (Senyo et al., 2022). The density, functionality, and

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reliability of these supply-side channels therefore remain central to the sustainability of financial inclusion efforts in LMICs.

Empirical studies demonstrate that the presence of mobile money agents leads to measurable welfare gains. Households in areas with greater agent coverage exhibit higher levels of savings, borrowing, and remittance activity (Aggarwal et al., 2020; Jack & Suri, 2014). Increased use of DFS is also associated with improvements in empowerment, financial health, and subjective well-being (Kodom et al., 2024; Osarfo et al., 2025). Parallel to this expansion, merchant payments where consumers make direct digital payments with traders or service providers represent the next frontier for deepening the digital finance ecosystems. As LMICs advance toward cash-lite economies, digitizing retail and service payments for utilities, education, and healthcare has become a policy priority (GSMA, 2023; World Bank, 2024). Merchant payments are important because they extend the usefulness of digital accounts beyond person-to-person transfers and cash withdrawals, helping users transact digitally at the point of sale and increasing the value of remaining within the formal digital financial system.

Despite the growing importance of agent networks and merchant payments, important evidence gaps remain. Existing studies are spread across different regions, intervention types, and outcomes, and often examine specific programmes or markets in isolation. Much of the literature on financial inclusion has focused on demand-side issues, particularly adoption, usage, and user-level welfare effects, while giving less systematic attention to the supply-side structures and operational conditions that make these outcomes possible. As a result, there is limited consolidated evidence on how agent network design, merchant acceptance, liquidity management, infrastructure, incentives, and expansion strategies influence access, usage, service quality, sustainability, and ecosystem development across LMICs. To address these evidence gaps, the Retail Finance Distribution (ReFinD) initiative was launched to promote rigorous, collaborative research on retail financial service delivery in LMICs. This Evidence and Gap Map (EGM) documents, organizes, and assesses the existing empirical literature on agent networks and merchant payments. It provides a systematic overview of what is known, identifies areas with limited or no evidence, and highlights opportunities for future research and policy experimentation. By mapping evidence across interventions, outcomes, and contexts, the EGM aims to guide stakeholders toward scalable and contextually appropriate solutions that enhance the reach, resilience, and inclusiveness of DFS systems.

This study contributes to the growing body of research on supply-side drivers of financial inclusion. Beyond summarizing existing studies, it provides a visual and analytical tool that enables researchers, policymakers, and practitioners to engage more effectively with the evidence base. The findings aim to inform both programmatic design and policy decisions that seek to amplify the financial participation of underserved and vulnerable populations across LMICs.

Why it Is Important to Develop the EGM

Given the fragmented state of the literature, an EGM is particularly well suited to this project. The value of this EGM lies not only in consolidating evidence on agent networks and merchant payments, but also in doing so from a supply-side perspective that has been underrepresented in prior evidence syntheses. While existing reviews have shown that digital finance expands financial inclusion, there is less systematic understanding of the delivery systems that determine whether such inclusion is reliable, scalable, and sustainable across settings.

This EGM will systematically identify, categorize, and visualize existing evidence on agent network and merchant payment interventions against key outcomes such as access and reach, usage and uptake, service quality, sustainability, and ecosystem development. In doing so, it will capture evidence on supply-side factors such as network organisation, agent and merchant incentives, liquidity management, infrastructure, interoperability, business viability, and expansion strategies. By consolidating dispersed evidence into a single, accessible framework, the EGM will enable funders, regulators, and implementers to identify areas of evidence concentration and critical gaps requiring further research. In resource-constrained contexts, this structured overview will support evidence-informed decision-making by clarifying what works, for whom, and under what conditions, thereby strengthening the design, scaling, and regulation of inclusive digital financial ecosystems in LMICs.

The methodological contribution of the EGM is also important. Rather than offering a narrative summary of selected studies, the EGM provides a transparent and systematic approach to identifying, classifying, and visualizing the evidence base across interventions, outcomes, and contexts. This makes the literature easier to interpret for decision-makers and helps distinguish between areas where the evidence is already substantial and areas where primary research, policy experimentation, or impact evaluation are still needed. The EGM therefore serves both an analytical function and a practical one, supporting more strategic research investment and more targeted policy design.

Existing EGMs. Existing EGMs on financial inclusion and digital finance have largely focused on demand-side outcomes, particularly user adoption and usage of financial services. For example, EGMs by Mader et al. (2022) include agent networks and merchant banking but emphasize end-user impacts rather than the supply-side structures and operational mechanisms that sustain these delivery channels. To date, no EGM has systematically examined agent networks and merchant payment systems from a supply-side perspective,

including organisation, liquidity, infrastructure, incentives, and expansion strategies. This proposed EGM fills this gap by consolidating evidence to inform policy, practice, and investment decisions that strengthen the sustainability and scalability of digital financial services.

Conceptual Framework

This framework draws on three complementary theoretical perspectives to explain how DFS agent networks and merchant payments drive financial inclusion outcomes:

Drawing upon the foundational work of Everett Rogers, whose Diffusion of Innovations (DOI) Theory (2003) provides a seminal framework for understanding how new ideas and technologies spread through social systems, a critical lens can be applied to the proliferation of Digital Financial Services (DFS) in underserved regions. Central to this application is the conceptualization of agent networks and merchant points as vital diffusion nodes. These entities function as crucial intermediators between the abstract, often intimidating, technological innovation (DFS) and the end-user in remote communities. They actively work to diminish two of Rogers' five key perceived attributes of an innovation that significantly influence adoption: complexity and relative advantage.

By offering tangible, face-to-face assistance with transactions such as cash-in/cash-out services, account registration, and troubleshooting, agents demystify digital platforms, thereby reducing the innovation's perceived complexity. Simultaneously, by integrating DFS into daily commerce, merchant points demonstrate the immediate utility and economic benefit of digital payments over traditional cash, making the abstract advantage concrete. Consequently, the theory posits that the density and quality of these agent networks and merchant points become paramount structural determinants of the adoption rate. A dense, accessible, and reliable network lowers the physical and cognitive barriers to trial and continued use, facilitating the critical stages of knowledge acquisition, persuasion, and decision within the innovation decision process. Conversely, a sparse or poorly managed network can exacerbate perceptions of risk and uncertainty, stifling diffusion. Therefore, within the DOI framework, the strategic development and management of these human-infrastructure nodes are not merely operational concerns but are fundamental to accelerating the diffusion curve, enabling DFS to transition from an early adopter phenomenon to a mainstream technology within remote social systems.

Building upon the seminal work of Oliver E. Williamson and his Theory of Transaction Cost Economics (TCE) (1981), which posits that economic institutions evolve to minimize the costs associated with market exchanges, the architecture of Digital Financial Services (DFS) can be analyzed as an institutional response to pervasive market frictions in remote and low-income economies. In this framework, traditional formal banking often imposes prohibitive transaction costs on the underserved, including high search costs to locate a physical branch, significant information costs to understand complex financial products and terms, and considerable contracting (or bargaining) costs to establish and maintain an account amid stringent identification requirements. Similarly, a cash-only system, while simple, carries its own burdensome costs, such as the risks of theft, loss, and the time/expense of travel for payments or savings storage. The intervention of DFS, particularly when mediated by localized agents and integrated merchant points, functions as a hybrid governance structure that dramatically attenuates these costs. By embedding financial access within the existing social and commercial fabric of a community, agents reduce search and information costs by providing proximate, personalized education and service. They also lower contracting costs by simplifying onboarding processes and acting as trusted intermediaries who mitigate the enforcement and monitoring costs associated with digital transactions. This cost-efficient institutional arrangement lowers the effective price of participation in the formal economy, thereby facilitating greater market inclusion for the underserved. It enables them to engage in a wider array of economic activities from receiving digital payments and accessing credit to paying bills remotely that were previously uneconomical due to high transaction barriers. Thus, from a TCE perspective, the DFS-agent ecosystem is not merely a technological deployment but a cost-minimizing institutional innovation that redefines the boundaries of the market, pulling marginalized populations into the sphere of formal financial exchange by aligning the governance of transactions with the specific asset specificity, uncertainty, and frequency characteristics of their economic lives.

Amartya Sen's transformative Capabilities Approach provides a robust theoretical framework where the discourse on financial inclusion transcends the narrow, instrumental metric of mere access to financial products. Sen's paradigm shifts the evaluative focus from resources or utilities to what individuals are substantively able to be and do their capabilities and functioning. Within this context, financial inclusion is reconceptualized as a process that should expand the real freedoms and agency of individuals, thereby enhancing their core capabilities to live a life they have reason to value. Specifically, financial services are not ends in themselves but are instrumental to achieving vital beings and doings, such as attaining economic security through safe savings and insurance, exercising empowerment through independent economic decision-making, and building resilience to withstand shocks without catastrophic impoverishment. However, the approach introduces a critical, person-centered caveat: the provision of a tool, such as a mobile money account via Digital Financial Services (DFS), constitutes only the provision of a means and not an expansion of capability per se. The conversion factors: social, personal, and environmental conditions that enable an individual to transform a resource into a valued achievement are paramount. Therefore, the quality of access including reliability, affordability, user-friendliness and the

broader functionality of the ecosystem (supportive regulation, robust agent networks, digital literacy, merchant acceptance, and gender norms) become the decisive determinants of whether DFS genuinely enhances capabilities or merely represents a nominal, and potentially exclusionary, technological placeholder. In essence, Sen's framework demands that analysis moves beyond counting accounts to scrutinize how the DFS ecosystem either fosters or constrains an individual's substantive freedom to leverage financial tools for improved economic security, personal empowerment, and resilient well-being, thereby making the process of financial inclusion itself a matter of justice and development freedom.

The literature identifies a clear pathway of effect: The presence of agents and merchants increases DFS usage which then alters people's financial behavior and culminates in improved welfare outcomes (Jack & Suri, 2014; Osarfo et al., 2025; Suri, 2017). The key mechanisms are accessibility, trust, affordability, usability, and network effects.

The goal of DFSs is to enhance the financial health, economic resilience, and wellbeing of underserved populations in Lower- and Middle-Income Countries (LMICs). To do this, the primary outcome domains include increased frequency and diversity of DFS use including savings, payments, and insurance, improved resilience, planning, security, and control over finances. Additional outcomes include increased consumption smoothing, entrepreneurship, investments in human capital (in health and education especially), and women's empowerment. Ultimately, DFS usage should help create a more robust, inclusive, and efficient financial system. Table 1 below shows a logic model[1] that defines the critical dimensions, their components, and theorized pathways through which they operate.

Our theory of change posits that a viable agent network and a thriving merchant payment ecosystem are foundational supply-side dimensions. They interact with user capabilities and are shaped by the regulatory environment. High density reliable agent networks directly reduce the physical and trust barriers to initial DFS adoption (Jack & Suri, 2014) which leads to basic usage. Then, as a dense merchant network develops, the usage of DFS shifts from mere cash conversion to digital payment for goods and services. This creates network effects, locks in users, and generates digital data (GSMA, 2023).

Digital transaction trails from merchant payments and agent use can enable new financial products such as cashflow based credit for SMEs under conducive regulations. When combined with user literacy, this allows individuals and businesses to better manage risk, invest, and smoothen consumption leading to improved financial health and socioeconomic welfare (Kodom et al., 2024; World Bank, 2024). Gender, rurality, and informality are also critical moderators. For instance, women's access to DFSs is severely mediated by social norms and agent location. The regulatory environment can tackle these gaps through tiered know your customer initiatives or gender-sensitive consumer protection and initiatives.

In conclusion, this framework provides a structured, theory grounded map for the ReFinD EGM. It moves beyond listing factors to hypothesize how and why different dimensions of the agent-merchant ecosystem interact to produce financial inclusion outcomes. It guides the mapping by specifying what evidence to look for within each dimension and along each pathway, enabling the identification of critical evidence mapping by specifying what evidence to look for within each dimension and along each pathway. This enables the identification of critical evidence gaps such as the impact of merchant interoperability on women's entrepreneurship or the role of agent training in reducing fraud.

Objectives

The study seeks to address the following objectives:

- Systematically identity and map existing evidence on the development of agent networks and merchant payments in LMICs.
- Identify gaps in the current literature and prioritize areas for further research and intervention.
- Facilitate evidence-based decision-making among policymakers, practitioners, and researchers.
- Assess trends in the volume and nature of studies commissioned before and after the ReFinD initiative to understand its contribution to the research ecosystem on agent networks in LMICs.

Methods

Evidence and Gap Map: Definition and Purpose

Evidence and gap maps are systematic outputs of evidence synthesis that visually represent existing evidence pertaining to specific research questions (Snilstveit et al., 2013; White et al., 2020). These maps delineate areas where evidence is available, areas where evidence is insufficient and assess the quality of the existing evidence.

Typically, an evidence and gap map is structured as a two-dimensional matrix, with interventions listed as row headings and outcomes as column headings (Snilstveit et al., 2016; White et al., 2020). Each cell within the matrix displays studies that provide evidence on the corresponding intervention and outcome.

Framework Development and Scope

We will adhere to the procedures and standards outlined in the Campbell Collaboration's checklist and guidance for Evidence and Gap Maps (EGMs) (White et al., 2018, 2020). The scope of this EGM is defined by the Population, Intervention, Comparison, Outcomes, and Study Designs (PICOS) framework, although the 'Comparison' aspect will not be

Table 1

Logic Model

Dimension	Key components	What this dimension means	Key mechanisms (how it works)	Intermediate outcomes	Supply-side financial inclusion outcomes
Agent network viability	-Agent density & proximity -Agent liquidity & reliability -Agent profitability -Training & operational support	The physical and operational agent infrastructure that enables cash-in/cash-out (CICO) and last-mile DFS delivery.	• Reduces delivery costs and downtime • Improves service reliability and coverage • Strengthens agent incentives to remain active	• More accessible and reliable DFS delivery points • Lower agent failure and float-outage rates • Increased provider confidence in last-mile delivery	→Expanded and sustainable service delivery networks → improved reliability of DFS supply → greater provider reach to underserved areas
Merchant payment ecosystem	-Merchant acceptance & density -Interoperability -Affordable merchant fees -Value-added services (e.g., inventory credit)	The ecosystem of merchants that accept digital payments, enabling providers to shift from CICO-heavy models to transaction-based ecosystems.	• Generates transaction volumes and network effects • Reduces provider dependence on cash-based services • Enables data generation for product design	• Increased volume and diversity of digital transactions • Stronger business case for merchant acquisition • Improved data availability for providers	→ Diversified and scalable DFS business models → Increased provider revenues from non-CICO services → More sustainable DFS supply
User capabilities & trust	• Digital & financial literacy • Perceived security & privacy • Social norms and networks (including gender norms)	User-side capabilities and trust factors that affect uptake and effective use of provider-supplied DFS products.	• Reduces inactive accounts• Improves product utilization and retention • Lowers customer acquisition and support costs	• Higher active usage rates • Reduced churn and dormancy • More predictable demand for DFS products	→ Improved efficiency of DFS supply → Higher returns on provider investments → More inclusive product portfolios
Enabling regulatory environment	• Agent and merchant licensing rules • Consumer protection frameworks • Data privacy & open finance policies • Competitive, level playing field	The policy and regulatory framework shaping how DFS providers operate and scale.	• Reduces regulatory risk and uncertainty • Encourages competition and innovation • Protects providers and consumers	• Scalable and compliant provider operations • Increased market entry and innovation • Greater system-level trust	→ Resilient and competitive DFS markets → Long-term sustainability of DFS supply → System-wide supply-side financial inclusion

See Supporting Information: Appendix 1 for definitions visual representation of the logic model.

specified. The studies will concentrate on supply-side mechanisms aimed at developing or strengthening existing enablers within the digital financial inclusion ecosystem (see Tables 2 and 3 for intervention and outcome indicators). This EGM will also cover the development of agent and merchant networks, capacity building, institutional strengthening, digital financial infrastructure and innovation, as well as policy, regulatory, and market enablers.

This EGM will include on-going and completed studies employing experimental, quasi-experimental, non-experimental, qualitative, as well as systematic reviews and scoping reviews. Eligible evaluation studies will include impact evaluations, process evaluations, formative evaluations, and summative evaluations. Peer-reviewed journal articles, preprints, technical and policy reports, conference papers, working papers, discussion papers, dissertations, and study protocols will also be included in the EGM.

Additionally, this EGM will not investigate the intersections between the two primary outcomes. It will include evaluations and studies assessing the effects of agent network and merchant payment interventions related to the outcomes of interest, employing quantitative methods (including experimental, quasi-experimental, and non-experimental designs), as well as systematic reviews and meta-analyses. Studies utilizing qualitative designs will also be incorporated.

Dimensions

Types of Population (as Applicable). The study population for this EGM is actors and contexts directly involved in agent networks and merchant payment systems in Low and Middle-Income Countries (LMICs), with a geographical focus on Sub-Saharan Africa (SSA), South Asia (SA), Southeast Asia (SEA) and South America. The actors comprise retail and banking agents, merchants, financial service providers and regulators, and aggregators and super-agents. For the purposes of this EGM, we define the various actors as:

- **Retail and banking agents:** Intermediaries who provide financial services on behalf of formal financial institutions such as banks, mobile network operators, or fintech companies. E.g., mobile money agents, banking correspondents, or cash-in/cash-out operators who facilitate deposits, withdrawals, fund transfers, bill payments.
- **Merchants:** Individuals or businesses that accept and process digital or electronic payments for goods and services. E.g., small and medium-sized enterprises (SMEs), shop owners, and digital payment merchants.
- **Financial service providers and regulators:** Institutions and organizations that design, manage, or regulate agent and merchant payment systems. E.g., Banks, microfinance institutions, fintech firms, Central Bank, fintech association, etc.
- **Aggregators and Super Agents:** Intermediaries that provide support to a network of sub-agents, providing liquidity, training, and logistic support.
- **Consumers/Users:** Individual end-users who utilize agent and merchant payment services to carry out financial transactions. Examples include smallholder farmers using mobile money or retail banking services, market traders making or receiving digital payments, and households accessing financial services for transfers, savings, or daily transactions.

Given that this EGM focuses on supply-side actors, we will exclude studies on consumers of financial services. Also, if a study was carried out in countries outside of SSA, South Asia, South East Asia, and South America it would be excluded. For equity considerations, this EGM will capture variations across gender (female agents, female merchants); firm size (micro-enterprises); and location (rural agents and merchants in rural areas).

Types of Intervention. The intervention for this EGM is limited to supply-side mechanisms aimed at developing new or strengthening existing digital financial inclusion ecosystem enablers, including agent and merchant network development, capacity building and institutional strengthening, digital financial infrastructure and innovation, and policy, regulatory, and market enablers. The choice of these interventions hinges on their ability to enhance the efficient delivery of financial services, particularly to the last mile in rural and underserved areas in SSA, SA, SEA, and South America. The four major categories of interventions are further classified into sub-categories, along with their corresponding definitions and examples (see Table 2 for description).

Comparison. This EGM will not specify a formal comparison group. However, it will include impact and comparative studies that examine differences across interventions, contexts, or implementation approaches related to agent networks and merchant payment systems.

Types of Outcome Measures (as Applicable). In this EGM, outcomes will be used as eligibility criteria for inclusion, based on five broad outcome domains: access and reach, usage and uptake, quality, reliability and trust, sustainability and market development, security, equity outcomes. The categories and sub-categories are presented in Table 3.

Types of Study Design. The EGM will include studies whether published or unpublished with these study designs:

(1) Experimental study
(2) Quasi-Experimental/Natural Experiments
(3) Descriptive/Observational Qualitative

Table 2

Intervention Examples: Categories, and Sub-Categories

Category	Sub-category	Definition	Examples
Agent and merchant network development	Network expansion and reach	Interventions that aim to grow and strengthen agent and merchant networks, especially in underserved and rural areas, to improve access to financial services.	• Recruitment of new agents/merchants • Licensing of new agents/merchants • Rural deployment incentives • Share of agent networks among providers • Start-up support in low-access areas
	Liquidity support	Measures that enhance the liquidity for agents and merchants to deliver financial services efficiently.	• E-float financing schemes • Cash management systems
	Infrastructure support	Interventions that enhance the infrastructure available to agents and merchants to deliver financial services efficiently.	• Access to POS devices, connectivity, and power banks (solar kits, boosters) • Agent kiosk
Capacity building and institutional strengthening	Training and skills development	Initiatives that enhance the knowledge, skills, and competencies of agents, merchants, and financial service providers to improve service quality and sustainability.	• Agent certification programs • Customer service and compliance training • Digital and financial literacy for merchants • Gender-sensitive training modules
	Institutional and regulatory capacity support	Programs that build the technical and managerial capacity of financial service providers, regulators, and policymakers to sustain inclusive digital ecosystems.	• Central bank digital finance training • Support for agent/merchant supervision • Technical assistance to fintech associations, agent associations, bankers' associations
Digital financial infrastructure and innovation	Technology and system modernization	Investments in digital and payment infrastructure that enhance transaction efficiency, reliability, and interoperability.	• Real-time transfer payment systems • National payment switches • Digital ID integration for onboarding • API-based interoperability between banks and fintechs
	Product and service innovation	Development of new or improved financial products and delivery mechanisms to support inclusion through agents and merchants.	• QR-code and contactless payments e.g. tapping a contactless-enabled card, phone, or wearable device • Mobile money app innovations • Bundled savings or insurance products for merchants
	Security and surveillance	Innovations that aim to improve security at the agents' or merchants' business location	• CCTV camera systems installation • Cash counting machines
Policy, regulatory, and market enablers	Regulatory reforms and policy frameworks	Reforms that enable innovation, reduce barriers to entry, and promote safe, competitive, and inclusive agent and merchant operations.	• Simplified KYC for low-value accounts • Licensing frameworks for non-bank agents • Gender-inclusive digital finance policies
	Consumer protection and risk management	Measures to safeguard customers and agents from fraud, unfair practices, and operational risks.	• Digital fraud monitoring • Data protection frameworks • Consumer complaint mechanisms • Tariff posting
	Market development and incentives	Initiatives that create enabling environments and partnerships for scaling digital payments and agent networks.	• Fintech sandboxes • Merchant digitization subsidies • Transaction fee reductions or incentives

Table 3

Outcomes Categories and Sub-categories: Definitions and Examples

Category	Sub-category	Definition	Examples/Indicators
Access and reach	Service point availability and density	Availability of agents and merchants relative to population and geography.	• Number of agents/merchants per 1,000 adults • Number of agents in rural vs. urban areas • Adaptation and usage of merchant payments
	Geographic accessibility	Physical ease of reaching financial service points.	• Distance to nearest agent • Travel time • Waiting time • Travel risks
	Population/Coverage and inclusion	Extent to which different population groups can access services.	• Share within 5 km of agent • Access among women, youth, persons with disabilities
	Account access and onboarding	Uptake of entry-level financial services through agents/merchants.	• Number of new accounts; agent-facilitated registrations
Usage and uptake	Transaction volume and value	Total quantity and value of transactions conducted.	• Mobile money sales/volumes • Value of transactions • Agent revenues
	User activity and transaction frequency	Regularity of service usage among customers.	• Active users per month • Frequency of cash-in- cash-out • Number of digital merchant payments processed • Repeat usage rates
	Product adoption and diversity	Breadth of financial services used by customers.	• Uptake of savings, credit, insurance • Multi-product usage
	Merchant payment adoption	Extent to which merchants accept and use digital payments.	• Number of merchants accepting digital payments • Growth in merchant transactions • Share of customers using multiple services • Number of innovations • Improved financial service usage by merchants
Quality, reliability, and trust	System performance and reliability	Operational stability and efficiency of service delivery systems.	• Transaction success rates • System downtime or frequency failure • Average transaction processing time • Efficiency of adoption • Network connectivity and system response
	Service efficiency	Speed and cost-effectiveness of transactions and services.	• Transaction time • Service costs
	Customer experience and satisfaction	User perceptions of service quality and usability.	• Customer satisfaction scores • Number of complaints received and resolved • Transparency of fees and pricing
	Trust and perceived safety	User confidence in the safety and fairness of services.	• Perceived fraud risk • Transparency of fees • Trust in agents

(continued)

Table 3

(continued)

Category	Sub-category	Definition	Examples/Indicators
Sustainability and market development	Agent and merchant viability	Financial sustainability and retention of agents and merchants.	• Agent profitability (revenues minus costs) • Agent costs • Average commission earned per transaction • Retention rates of active agents • Access to working capital and liquidity • Expenditure • Return on assets • Return on equity • Number of permanent branches of mobile money business • Value of transactions • Number of clients
	Market expansion and investment	Growth and deepening of the digital financial ecosystem.	• Level of private sector investment in agent/merchant networks • Growth of partnerships among banks, fintechs, and MNOs • Number of permanent branches
	Ecosystem development and integration	Degree of system-wide coordination and interoperability.	• Interoperable platforms • Bank-fintech partnerships • Network integration
	Policy and regulatory outcomes	Effects of policies on enabling inclusive financial systems.	• Adoption of inclusive policies • Regulatory improvements
Security and equity outcomes	Transaction security and fraud	Incidence and management of fraud and security risks.	• Report fraud cases • Theft incidents • Security breaches
	Risk exposure and mitigation	Vulnerability of users and agents to financial and operational risks.	• Losses due to fraud • Protection mechanisms
	Gender and social inclusion outcomes	Differences in outcomes across gender and social groups.	• Gender gaps in access/usage • Female agent participation • Gender composition of firm ownership
	Distributional equity across groups	Variation in benefits across population subgroups.	• Disparities by income, location

(4) Qualitative study
(5) Systematic Reviews/Meta-Analyses

Studies that look at effectiveness of interventions for instance process evaluations, summative evaluations, qualitative evaluations impact evaluations modeling studies (for models based on primary data and not hypothetical values), and analytic framework will be included.

Given the limited availability of literature in this area, this Evidence and Gap Map adopt an inclusive approach by allowing a wide range of study designs in order to capture all relevant evidence and assess the distribution of research across different methodologies. Eligible studies therefore include diverse quantitative and mixed-methods approaches with clearly described research methodologies (such as exploratory, narrative, deductive, inductive, ethnographic, and grounded theory approaches), as well as systematic and scoping reviews, peer-reviewed articles, preprints, reports, and discussion and working papers, ensuring comprehensive coverage of the existing evidence base. These included designs are appropriate for capturing effectiveness, implementation, and contextual evidence relevant to ReFinD.

How We Plan to Handle Adverse Outcomes. This EGM will examine studies in which interventions related to agent networks and merchant payment systems resulted in adverse or unintended outcomes. This approach is intended to ensure balanced reporting of intervention effects and to reduce the risk of focusing only on positive results (White et al., 2020). Adverse outcomes will be categorized alongside positive outcomes according to the relevant outcome domains, ensuring neutrality in the assessment of evidence.

Search Methods and Sources

Search Strategy. The searches for the Evidence and Gap Map (EGM) will be conducted systematically, following established protocols for comprehensive and transparent evidence identification. The search strategy is designed to capture both academic and grey literature on interventions that strengthen agent networks and merchant payment systems for advancing financial inclusion in Low- and Middle-Income Countries (LMICs), with particular emphasis on Sub-Saharan Africa (SSA), South Asia (SA), Southeast Asia (SEA) and South America.

A wide range of bibliographic databases and grey literature sources will be searched to ensure broad coverage of relevant studies. In addition, backward and forward citation tracking will be conducted for included studies and relevant systematic reviews. Key authors and institutions active in digital finance and financial inclusion research will also be consulted where appropriate.

Database Sources. Search will be conducted across a range of academic databases to capture literature from economics, development studies, finance, information systems, and public policy. These databases will include Web of Science, Scopus, EconLit, JSTOR, and African Journals Online (AJOL). Together, these sources provide comprehensive coverage of peer-reviewed research relevant to agent networks, merchant payments, and financial inclusion in LMIC contexts.

In addition to academic sources, extensive search will be conducted across key grey literature repositories to identify policy-relevant and practice-oriented evidence. These will include the:

- World Bank Group's Open Knowledge Repository
- International Monetary Fund
- Consultative Group to Assist the Poor (CGAP)
- Alliance for Financial Inclusion (AFI)
- Innovations for Poverty Action (IPA)
- Abdul Latif Jameel Poverty Action Lab (J-PAL)
- SSRN
- IDEAS/RePEc
- United Nations Capital Development Fund (UNCDF)
- Development bank portals, including those of the African Development Bank and the Asian Development Bank
- Gates Foundation

To identify existing reviews and evidence syntheses relevant to the scope of the EGM, searches will also be conducted in systematic review repositories, including the:

- Campbell Collaboration Library,
- 3ie Systematic Review Database,
- Cochrane Database of Systematic Reviews.
- American Economic Association registry for randomised controlled trials.

The search strategy will follow a Population – Intervention - Outcome (PIO) strategy. Search strings will combine terms related to agent networks and merchant payment interventions with terms related to financial inclusion and key outcome domains such as access, usage, adoption, transaction activity, and sustainability. Study design terms will not be included in the search strings in order to avoid the unintended exclusion of relevant evidence, particularly descriptive, qualitative, and mixed-methods studies.

Where available, geographic filters for LMICs and specific regions, including SSA, SA, SEA, and South America will be applied at the database level to improve relevance while maintaining sensitivity.

The searches will be limited to studies published from the year 2000 onwards, reflecting the period during which agent banking, mobile money, and digital payment systems have expanded in LMICs. Only studies published in English will be included. The geographic focus will be on LMICs, with regional filters applied where it is possible to capture evidence from SSA, SA, SEA, and South America. Eligible publication types will include journal articles, working papers, technical and policy reports, conference papers, dissertations, protocols, and preprints.

Use of Boolean Operators, Truncation, and Wildcards

Boolean operators will be used to combine search concepts and structure search strings, while truncation and wildcard symbols will be applied to capture variations in spelling, plural forms, and word endings. These techniques will be used to balance sensitivity and precision, ensuring that relevant studies are identified without unduly narrowing the search.

Search Terms. Search terms will be developed through an iterative, multi-step process. Intervention and outcome terms will be derived directly from the PICOS framework to ensure conceptual alignment between the scope of the EGM and the search strategy. Key background studies and benchmark papers will be reviewed to identify commonly used terminology and alternative expressions. Synonyms and controlled vocabulary terms, including database-specific subject headings (such as those used in Scopus and EconLit), will be incorporated to expand the reach of the search. Search strings will be adapted as necessary across databases to account for differences in indexing practices and search syntax. To ensure adequate sensitivity, a set of known relevant studies will be cross-checked against the search results. Refer to Appendix 2 for sample search terms and results.

Supplementary Search Techniques. In addition to database searches, supplementary techniques will be employed to maximize coverage. Reference lists of all included studies and relevant reviews will be hand-searched, and forward citation tracking will be conducted using Google Scholar. Key institutional websites and repositories will be searched manually to

identify relevant reports and working papers. Where appropriate, experts and practitioners working in digital finance and agent network development may be contacted to identify ongoing or unpublished studies. Ongoing studies will be accessed through databases like 3ie impact evaluation repositories and evidence portal and the American Economic Association registry for randomised controlled trials.

Analysis and Presentation

Report Structure. The EGM report will follow a standard structure, comprising a plain language summary, background, methods, results, and conclusion. Any deviations from the protocol will be clearly noted.

- The plain language summary will provide an easy-to-understand overview of the map's main findings.
- The background section will discuss agent network and merchant payment interventions in LIMCs highlighting the context, rationale, and relevance of these interventions. This section will also present the logic model underpinning the EGM, detailing the conceptual framework, intervention categories, and outcome categories.

The methods section will outline the search strategy, inclusion and exclusion criteria, and procedures for data extraction from eligible studies. Additionally, a quality assessment plan will be provided, accompanied by a PRISMA flow chart, and the appendix will contain a comprehensive search strategy for all databases used.

In the results section, we will report the total number of studies retrieved from the databases, categorized by intervention type, outcome, and other relevant filters. Summary tables and figures will illustrate these findings. The conclusion will provide a synthesis of policy implications for researchers and decision-makers, highlighting gaps in the evidence and suggesting priorities for future research.

Key figures and tables to be included are:

- Conceptual framework/theory of change
- PRISMA flow chart
- Number of studies by intervention and outcome subcategories
- Number of studies by region

Filters for Presentation. To facilitate stakeholder use, the EGM will include **filters** that allow for the exploration of studies by:

- Geographical scope (country or region)
- Evaluation types (impact, summative, process, formative)
- Study status (complete, on-going)
- Publication type (journal article, working paper, book chapter)
- Publication year (2000−2024)

In the hard copy version, multiple 2 × 2 representations of the EGM will be provided. The online interactive version will allow users to apply these filters dynamically, displaying studies as visual "bubbles" that match selected criteria.

Dependency. The unit of analysis for the EGM is a study, defined as an analysis of a unique sample, including multiple time points for the same sample. Where a single study has multiple publications, the most recent and complete version is used. Studies reporting multiple interventions, outcomes, or study designs are coded across all relevant categories but counted only once in the EGM. If a study includes both eligible and ineligible interventions or outcomes, only those meeting the EGM criteria are coded.

Systematic reviews may include primary studies that are also independently represented in the EGM. Where multiple systematic reviews may refer to the same primary study, each systematic review will be included in the map as long as it meets the eligibility criteria.

Data Collection and Analysis

Screening and Study Selection. Duplicate studies or papers will be identified and removed before the screening process begins. Using the eligibility criteria for the proposed EGM review, papers or studies will be prioritized based on their relevance and importance. The screening will be caried out for both published and unpublished studies or papers in two phases – the title and abstract phase and the full text phase. Screening at the title and abstract phase will be done using a predetermined eligibility criterion (screening tool), as shown in Figure 1. This will be followed with a full-text screening for the studies or papers that passed screening at the title and abstract phase. Two reviewers will independently screen the studies or papers for each phase of the screening. Where there is disagreement around the inclusion of a paper in the EGM, the reviewers will collaborate to reconcile, and, if needed, a third reviewer will independently screen to resolve any disagreements.

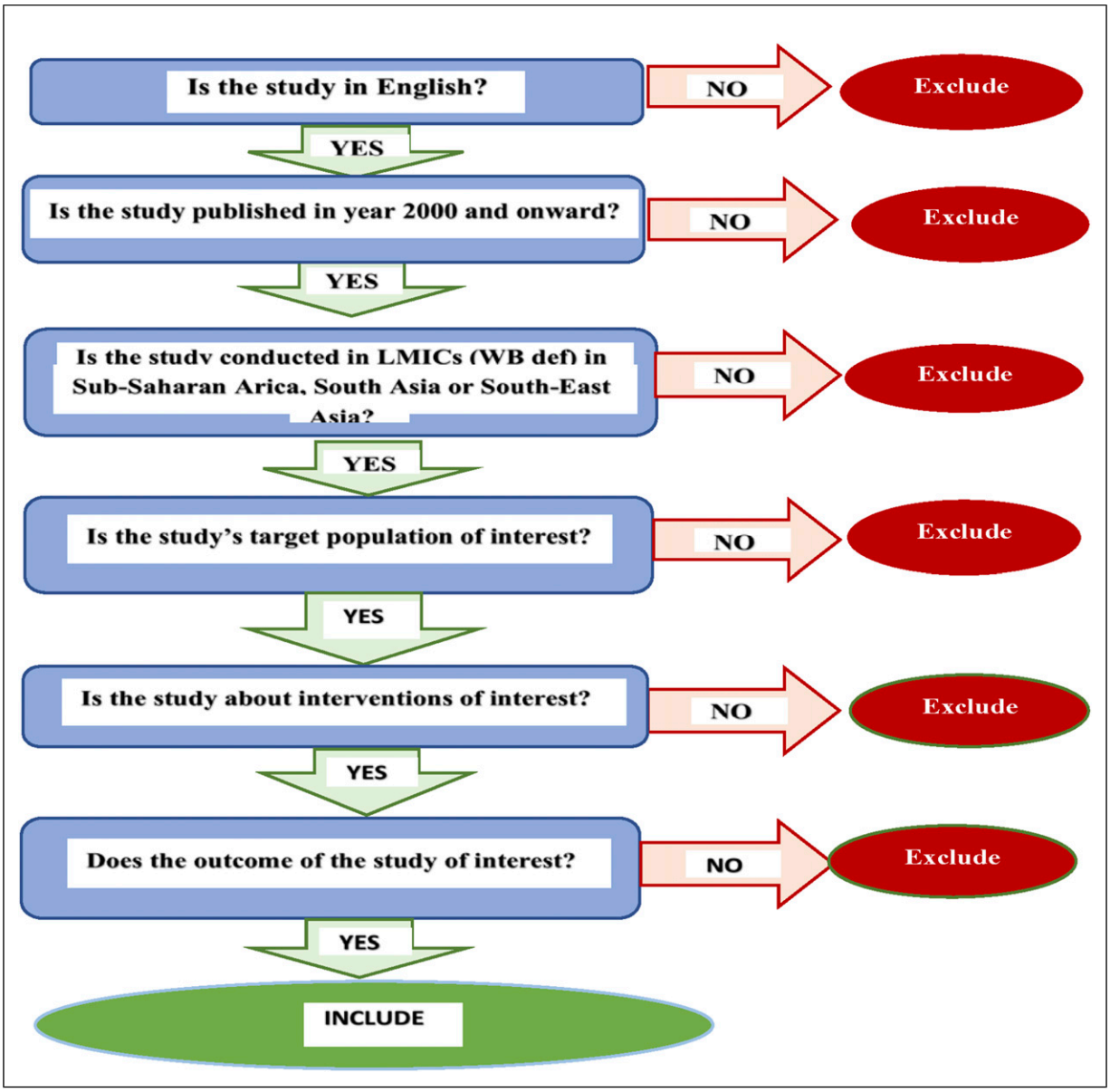
Data Extraction and Management

Coding

A standardized data extraction form will be developed and piloted to guide the extraction of key study characteristics, including region, country, language, population, study status, intervention, outcomes, study design, and evaluation type (Refer to Appendix 3 for the coding form). EPPI-Reviewer will be used to support data management, coding, and analysis. The preferred procedure is for at least two members of the EGM team to independently code each study, using the pre-

Figure 1

Screening Tool for the EGM



established extraction form. Discrepancies will be resolved through discussion and consensus, and where agreement cannot be reached, a third reviewer will adjudicate. If the volume of included studies makes full duplicate coding impractical, random samples of studies will be independently recoded by another team member to assess and report the reliability of the coding process. All reviewers will receive training on the coding framework prior to data extraction, and consistency checks will be conducted to ensure accuracy before full coding begins.

Data Cleaning

To ensure internal consistency, accuracy and completeness of all included records in the EGM, a structured data-cleaning process will be undertaken. The data cleaning is aimed at identifying and correcting discrepancies to confirm that all coded information aligns with the established inclusion criteria and the total number of included studies. The cleaning process will include frequency and cross-tabulation checks to verify that values recorded under key filters match the total number of included records. Inconsistencies (such as

mismatched totals, incorrect categories, or missing values) will be reviewed and corrected.

Data Analysis Plan

The data analysis plan will proceed in three phases – how studies (including systematic reviews) will be treated, analysis of included studies, and the development of the EGM.

Systematic review studies with multiple interventions and outcomes will be considered as a single study, but with each intervention and/or outcome assigned to a separate code in the EGM. Where there are studies with interventions that fall both within and outside the scope of the EGM, only the relevant studies within the scope of the EGM will be included. Furthermore, where different versions of published studies exist, the most recent publication will be considered (Malhotra et al., 2021).

The analysis of included studies in the EGM will be done using the EPPI-Reviewer software. This will largely involve exploring various summary statistics such as frequencies and percentages. Presentation of findings will be done in graphs, tables and cross-tabulations, all of which are aimed at demonstrating existing relationships between interventions, outcomes, and study designs. The findings will be synthesized and summarized to identify patterns and gaps.

The development of the EGM will be done using the EPPI-Reviewer and Mapper software. These tools will be utilized in coding, analysis and creation of the EGM. The frequencies of studies established in evidence will be visually represented in the EGM using bubbles or mosaics of varying sizes with each bubble size or mosaic count corresponding to the frequency of a particular outcome or intervention.

Presentation of EGM

The EGM will be presented graphically in a matrix of two dimensions which primarily displays the interventions and outcomes. The framework of the map will be established through collaborative discussions with key stakeholders such as Campbell Collaboration and ISSER. We will include filters within the matrix to allow for the organization and display of results for different selected variables such as interventions, outcomes, study designs, study status, country, region and location.

Tools for Assessing Risk of Bias/Study Quality of Included Reviews

The systematic reviews included in the EGM will be subjected to critical quality appraisal using the AMSTAR 2 tool. The AMSTAR 2 tool is a critical appraisal instrument designed to evaluate the methodological quality and confidence in the results of systematic reviews that include randomized and non-randomized studies of various interventions. It is used to rate the overall confidence in a review's findings as "high," "moderate," "low," or "critically low" based on 16 items covering key domains like protocol registration, search strategy justification, risk of bias assessment, and appropriateness of meta-analytic methods. This method, however, has some limitations. It does not assess the certainty of the evidence nor evaluate the relevance of a review's findings. Given the limited time for developing the EGM, the quality of primary research or studies will not be evaluated. Following the study of White et al. (2020), we will report on the study designs used by eligible studies and present them as filters within the EGM.

Pilot Study of EGM

Before developing the full Evidence and Gap Map (EGM), we will conduct a pilot exercise to test and refine our search strategy, screening process, and coding tools (Albers et al., 2019; White et al., 2020). This pilot will be conducted iteratively, allowing the research team to improve each component based on lessons learned from successive rounds of testing. As part of the pilot, we will apply the draft coding form to a small sample of approximately 20–30 studies that meet the eligibility criteria for inclusion in the EGM (Albers et al., 2019; White et al., 2020). This process will help assess whether the coding categories are clear, comprehensive, and practical to apply. Based on the findings from each round of the pilot exercise, the EGM framework, including the intervention and outcome categories (row and column headings), the search strategy, and the coding for will be revised, refined, and, where necessary, redefined (White et al., 2020).

During the iterative pilot process, we will consider refining category labels and introducing additional filters or subcategories that may improve the usefulness of the EGM. However, we will do so cautiously to ensure that the map remains manageable and user-friendly, avoiding unnecessary complexity (White et al., 2020). We will also develop a trial version of the EGM to assess the practicality of its presentation and features. This trial EGM will be shared with key stakeholders, including development practitioners, academics, policymakers, the Campbell Collaboration, and the Bill and Melinda Gates Foundation, to obtain feedback on features such as searchable filters and the clarity of row and column labels (White et al., 2020).

The final search strategy and coding forms will be included in the EGM protocol. The pilot exercise and the full EGM development will be conducted by the same research team, led by the Principal Investigator, to ensure consistency and methodological rigor throughout the study.

Inter-Rater Reliability

To ensure compliance with Campbell standards during screening, we will target an 80% inter-coder agreement rate. If this threshold is not consistently met, we will hold reconciliation sessions to resolve disagreements and provide additional training as needed to uphold the required standards. Throughout the process, multiple online training sessions will

be conducted to thoroughly review the PICOS framework and the inclusion and exclusion criteria, ensuring all coders are fully aligned with the requirements. All coders involved in the screening possess strong backgrounds in economic research and development studies, with specialized expertise and research interests in financial inclusion, agent banking, and merchant banking.

Stakeholder Engagement

Various discussions with stakeholders will be conducted to determine the scope of the EGM. This includes the ReFinD team at ISSER, their grantees and partners. We will also engage with some financial institutions and researchers in the financial field from the University of Ghana. Throughout the whole process of EGM development, we would be working in tandem with the Cambell Collaboration for the title registration process and map development. Once the map is developed, we will convene stakeholders to provide their feedback. We will then share the draft map to them and the entire public as his EGM will be a public good and will be published in open access journal.

Given the multi-country scope of this study, stakeholder engagement will extend beyond Ghana to include participants from countries covered in the EGM, particularly across Sub-Saharan Africa, South Asia, Southeast Asia, and South America. These stakeholders will include researchers, policymakers, and practitioners with experience in digital financial services, including the ReFinD team at ISSER, as well as their grantees and partners, ensuring that diverse regional perspectives are reflected.

In addition, regional and global institutions actively working in financial inclusion and digital payments such as the African Development Bank, Asian Development Bank, World Bank Group, International Finance Corporation, United Nations Capital Development Fund, International Fund for Agricultural Development, and Alliance for Financial Inclusion will be engaged. These stakeholders have been selected due to their roles in shaping policy and generating evidence on digital financial inclusion, agent networks, and merchant payments across LMICs.

Given the ReFinD team's active role in producing evidence on digital financial services in LMICs, some studies included in the EGM may be authored or co-authored by members of our team. To maintain transparency and minimize potential bias, all studies will be assessed using the PICOS criteria.

All studies, including those authored by our team, will be screened independently in EPPI Reviewer by two reviewers, with one reviewer not involved in the study, at both the title/abstract and full-text stages. During the data extraction and coding phase, key information such as intervention characteristics, outcomes, and study context will also be collected independently by two reviewers, one of whom is not affiliated with the study. Any discrepancies will be resolved through discussion, and if necessary, by a third independent reviewer.

Stakeholders will be purposively selected based on their expertise in digital financial services, involvement in agent and merchant networks, and representation across regions included in the EGM. Engagement will occur at multiple stages of the study, including initial consultations to refine the scope and framework, and subsequent workshops and consultations to review the draft EGM. Throughout the process, the research team will work in collaboration with the Campbell Collaboration to ensure adherence to established methodological standards, particularly during title registration and map development. All stakeholder feedback will be systematically documented and reviewed by the research team, and relevant inputs will be incorporated into revisions of the EGM framework.

Plans for Updating the EG

This EGM could be updated depending on the availability of funding.

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Author Contributions

David Ameyaw is the President and Chief Executive Officer of the organization and serves as the Team Lead for the project. He brings extensive experience in evaluation research, evidence synthesis, and the development of Evidence and Gap Maps (EGMs), alongside strong expertise in project design, management, and policy-relevant research across Africa. He provides overall strategic leadership and quality assurance for the study. **Sheila Agyemang Oppong** is a research and evidence synthesis specialist with a PhD in Development Economics and serves as the Principal Investigator (PI) for the project. She has substantial experience in the design and implementation of EGMs, systematic reviews, and policy-focused research. She will lead the technical aspects of the evidence synthesis, including protocol development, methodological oversight, and data analysis. **Peter Quartey** is a Professor of Development Economics and former Director of the Institute of Statistical, Social, and Economic Research (ISSER). He has extensive expertise in development economics, financial systems, and monetary policy, and has led numerous research initiatives in the financial and monetary sectors. He provides senior academic guidance and subject-matter expertise for the project. **Kwadwo Danso-Mensah** is the Director of Research at ICED with a PhD in Development Economics. He has significant experience in evaluation design, applied research, and evidence-informed policymaking. He will contribute to methodological rigor, quality assurance, and interpretation of findings.

Miriam Oppong is a researcher at ICED and a PhD candidate in Agribusiness. She has experience in EGM development, information retrieval, and quantitative and qualitative data analysis. She will support literature searching, screening, coding, and data management for the EGM. **Nana Esi Badu-Ansah** is a researcher at ICED with a background in Development Studies. She has experience in evidence synthesis, data management, and analysis. She will contribute to study screening, coding, and synthesis, with particular attention to consistency and data quality. **Daniel Osarfo** holds a PhD in Development Economics and is a Post-Doctoral Research Fellow at ISSER-ReFinD. He has strong expertise in applied economic research and quantitative analysis and will support analytical interpretation and technical review of the evidence base. **Aisha Adam** holds a PhD in Economics and is a Post-Doctoral Research Fellow at ISSER - ReFinD. She has over a decade of experience in economic analysis, public financial management, and natural resource governance across Africa. She will contribute subject-matter expertise and support interpretation of findings relevant to financial systems and governance. **Clarice Panyin** Nyan holds a PhD in Population Studies with substantial experience in evidence synthesis, evaluation, and project management. She will support study screening, data extraction, and coordination of EGM activities. **Hannah Afra Darkwah** is an affiliate of the ISSER research department with a background in Economics from the University of Essex. She will support data analysis and contribute to the interpretation of economic evidence within the EGM. **Isaac Letsa** is a Programme Officer at ICED with experience in project coordination and implementation support. He will provide administrative and logistical support. He will support study screening, data extraction, and coordination of EGM activities.

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Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

No datasets have been generated or analyzed at this stage. Once the study is completed, the data will be made available in a publicly accessible repository in accordance with Campbell's data sharing policy.

EGM Methods Expertise

David Ameyaw, Sheila Agyemang Oppong, Kwadwo Danso-Mensah, Miriam Oppong, Nana Esi Badu-Ansah and Clarice Panyin Nyan have the expertise in EGM development process.

Information Retrieval Expertise

Miriam Oppong is the Research and Information specialist at ICED. She will lead the team in retrieving studies for the EGM development in the selected databases for both published and unpublished studies.

Coding and Data Management

Clarice Panyin Nyan and Sheila Agyemang Oppong will lead the team in all coding and data extraction activities.

Statistical Analysis

All team members will be involved in the statistical analysis of the EGM and reports, as all are professionals in statistical analysis.

Preliminary Timeframe

We plan to submit the full EGM report by May 2026.

Supplemental Material

Supplemental material for this article is available online.

Note

1. See Supporting Information: Appendix 1 for definitions visual presentation of the logic model.

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