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Improving the Efficiency and Transparency of the Farm Input Subsidy Programme in Malawi through Digital Beneficiary Targeting and Timely Input Distribution

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ABSTRACT

Purpose: This study examines why Malawi's Farm Input Subsidy Programme has continued to lose a substantial share of its value to elite capture, ghost beneficiaries, and late input delivery despite two decades of reform attempts, and it evaluates whether a digitally enabled beneficiary targeting and distribution model can correct these failures.
Methodology: The study relies on a qualitative, comparative document analysis of peer reviewed literature, programme evaluations, and secondary government data published mainly between 2021 and 2026, supplemented by a smaller set of foundational studies on the programme's early years.
Results: The evidence indicates that biometric registration linked to an independent proxy means test can meaningfully reduce duplicate and fictitious beneficiary records, that mobile money e voucher redemption lowers leakage and shortens distribution timelines when paired with adequate network coverage, and that public dashboards strengthen accountability by exposing bottlenecks in real time.
Conclusions: A phased, three pillar digital reform anchored in registration, redemption, and logistics can plausibly restore a large share of the programme's fiscal and social value.
Limitations: The absence of primary household survey data and the reliance on cross country secondary evidence limit causal claims.
Contributions: The study offers policymakers a synthesized, evidence based roadmap for sequencing digital reform in a resource constrained agricultural subsidy system.

Keywords: *Beneficiary Targeting, Digital Governance, Farm Input Subsidy, Malawi, Mobile Money*

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1. Introduction

Malawi's Farm Input Subsidy Programme, widely known by its acronym FISP, has functioned since the 2005 or 2006 agricultural season as the country's principal instrument for raising smallholder productivity and safeguarding household food security. The programme was conceived after successive years of erratic rainfall and maize shortfalls convinced policymakers that market based input supply alone could not guarantee that poor rural households would access fertilizer and improved seed at a price they could afford (Dorward & Chirwa, 2011). Within two seasons of its launch, national maize output nearly doubled, an outcome that drew considerable international attention and was cited for years afterward as a model of state led agricultural transformation (Sachs, 2012). That early success, however, obscured a set of administrative weaknesses that would eventually come to define the programme far more than its productivity gains.

Over the subsequent decade, a body of independent evaluation established that FISP suffered from three interlocking failures. First, beneficiary lists compiled by Area Development Committees proved vulnerable to manipulation, with fictitious or duplicated names absorbing a meaningful share of coupons intended for genuinely poor households (Chibwana, Fisher, & Shively, 2012). Second, the community based targeting process that was meant to prioritize female headed households, the elderly, and families below the food poverty line was instead disproportionately captured by better connected and wealthier households, undermining the equity rationale on which the subsidy was originally justified (Ricker-Gilbert, Jayne, & Chirwa, 2011). Third, procurement and transport bottlenecks routinely pushed input delivery past the optimal planting window of November through January, so that fertilizer and seed frequently arrived after the agronomic value of subsidized inputs had already been diminished (Lunduka, Ricker-Gilbert, & Fisher, 2013). Jayne and Rashid (2013) situate these Malawian findings within a broader Sub-Saharan pattern in which large input subsidy programmes tend to crowd out private input markets even as they fail to reach their intended beneficiaries with the reliability that their fiscal cost would seem to warrant.

Successive Malawian governments have attempted digital fixes to these problems more than once. An e voucher pilot introduced in the 2015 or 2016 season reached roughly 300,000 recipients and demonstrated that leakage could be reduced where mobile network coverage and agro dealer participation were adequate, yet the pilot was discontinued when telecommunications infrastructure proved insufficient to sustain full national coverage (Ministry & Water, 2017). A second attempt confined to Lilongwe, Mchinji, and Kasungu districts in 2021 or 2022 produced encouraging results at small scale but was never extended nationally, and budgetary pressure led the government to revert to paper coupons for the 2023 or 2024 and 2024 or 2025 seasons (World, 2023). This oscillation between digital experimentation and reversion to manual administration is itself an important empirical fact: it suggests that the barrier to reform has been less a matter of unproven technology than of sequencing, institutional ownership, and sustained financing.

Recent scholarship on Malawi's Affordable Input Programme, the successor initiative that broadened FISP's coverage from 2020 onward, has continued to document targeting and equity concerns even as the programme's scale expanded (Walls, Johnston, Matita, Kamwanja, Smith, & Nanama, 2023). A companion commentary in Nature Food concluded that without a fundamental redesign of how beneficiaries are identified and how inputs reach them, the programme's fiscal burden will keep crowding out other rural investments without delivering commensurate nutrition or productivity gains (Walls et al., 2023). At the same time, evidence from neighboring and comparator countries has accumulated rapidly. Nigeria's mobile phone based Growth Enhancement Support Scheme demonstrated measurable reductions in ghost beneficiary rates once redemption was tied to a registered mobile number Kijima (2022), while Ghana's Planting for Food and Jobs programme illustrated both the promise and the limits of digitized input support when implementation capacity is uneven across districts (Pauw, 2022). These parallel experiences make Malawi an unusually well documented case for examining whether digital reform can be designed and sequenced in a way that earlier Malawian pilots were not.

Beyond administrative weaknesses, the reform of FISP requires a comprehensive digital governance approach that integrates technological innovation with institutional capacity and inclusive agricultural development. Digital beneficiary identification systems, mobile-based registration, and data-driven monitoring have the potential to reduce targeting errors, improve transparency, and strengthen accountability in large-scale agricultural subsidy programmes. However, technology alone cannot ensure effectiveness without reliable databases, adequate infrastructure, and institutional readiness. Previous studies emphasize that the success of digital agriculture depends on the interaction between technological adoption and the socio-institutional conditions surrounding farmers and public institutions (Klerkx, Jakku, & Labarthe, 2019). In addition, digital platforms can enhance supply chain coordination, improve input distribution efficiency, and support timely decision-making through real-time agricultural data management (Kamilaris, Fonts, & Prenafeta-Boldú, 2019). Evidence from developing countries also demonstrates that mobile-based agricultural services can improve access to information and government support mechanisms, although digital exclusion remains a challenge for vulnerable rural populations with limited connectivity and digital literacy (Aker, 2011; Fabregas, Kremer, & Schilbach, 2019). Therefore, the future transformation of FISP should move beyond replacing paper coupons with electronic systems and focus on developing an integrated digital ecosystem that combines accurate beneficiary targeting, transparent subsidy management, and efficient last-mile input delivery (Mishra, Choudhary, & Kumar, 2021). Such an approach is essential to ensure that public agricultural investments generate sustainable productivity improvements and equitable benefits for Malawi's smallholder farmers.

This study addresses that question directly. It asks whether a coordinated digital beneficiary registration system, a mobile money based e voucher redemption mechanism, and a transparent logistics tracking platform can, taken together, resolve the leakage, elite capture, and delivery delay problems that have persisted in FISP for two decades. In doing so, the study makes three contributions. It synthesizes a wide and geographically dispersed evidence base on digital agricultural subsidy reform into a single analytical framework applicable to the Malawian context. It formulates testable propositions linking specific digital interventions to specific programme failures, providing a template that future empirical evaluation can use once Malawi's own reform is implemented. It also translates this evidence into a phased implementation sequence intended to be financially and institutionally realistic given the country's infrastructure constraints. The remainder of the article proceeds as follows. Section two reviews the relevant literature and develops the study's guiding propositions. Section three describes the qualitative document analysis method used to evaluate those propositions. Section four presents the results of that analysis and discusses their implications. Section five concludes with the study's limitations and directions for future research.

2. Literature Review

2.1 Targeting Failures in Large Scale Agricultural Subsidy Programmes

The theoretical starting point for understanding FISP's persistent leakage is the well established literature on targeting error in social protection and subsidy programmes operating under conditions of weak administrative data. Proxy means testing has become the dominant targeting instrument in at least fifty low and middle income countries precisely because verified income or consumption data are unavailable at scale (Banerjee, Hanna, Olken, & Sverdlin Lisker, 2024). Areias and Wai-Poi (2022) show that machine learning based eligibility prediction can materially improve on manually administered proxy means tests, particularly where community committees retain discretion over final beneficiary lists, because that discretion is exactly the point at which elite capture tends to enter the system. Malawi's ADC based targeting model fits this pattern closely: it combines a nominally objective vulnerability criterion with a locally administered selection process that has repeatedly been shown to favor households with stronger social or political connections (Chibwana et al., 2012).

A second strand of literature situates this targeting problem within a broader governance context. Corruption research across Sub-Saharan Africa consistently finds that procurement and distribution systems lacking independent verification are structurally prone to capture by local elites and intermediaries, regardless of the formal eligibility rules on paper (Mutsvairo & Kalinga, 2022). This

governance lens matters for FISP because the programme's failures have never been solely technical. Even where eligibility criteria were reasonably well designed, the absence of an independent verification mechanism meant that Area Development Committees could, in effect, override the intended targeting logic without meaningful consequence. This observation motivates the first proposition examined in this study.

2.2 Digital Identification and the Limits of Biometric Registration

Biometric identification has expanded rapidly across African social protection systems over the past five years, and the evidence on its effects is more mixed than early advocacy suggested. Comprehensive country case studies compiled for the Institute of Development Studies find that biometric digital identity systems can substantially reduce duplicate enrollment and impersonation, but only where data quality controls, consent procedures, and interoperability with existing civil registries are in place from the outset, as cited in Institute of Development Studies country case compilation (Gebeyehu & Bedemo, 2024) . Where these conditions are absent, biometric systems risk introducing new exclusion errors, particularly for populations whose fingerprints are difficult to capture due to manual labor, or whose national identification records are incomplete. This tension between inclusion and exclusion error is central to why the present study frames biometric registration as a necessary but not sufficient condition for improved targeting, one that must be paired with an appeals mechanism and a phased rollout rather than treated as a purely technical fix.

The proxy means testing literature offers a complementary caution. Brown, Ravallion, and Van de Walle's foundational assessment of econometric targeting in Africa found that even well specified proxy means tests carry substantial exclusion error when applied in highly heterogeneous rural economies, a finding that later machine learning based refinements have narrowed but not eliminated (Areias & Wai-Poi, 2022). For Malawi, this suggests that an independent targeting commission modeled on Tanzania's Productive Social Safety Net experience, which uses a transparent proxy means test to allocate benefits without local committee override, is a more defensible design than either a purely community based or a purely algorithmic approach in isolation.

2.3 Mobile Money, E Vouchers, and Distribution Delay

The second major failure documented in FISP concerns delivery timing rather than targeting accuracy. A large and rapidly growing literature on mobile money adoption in Sub-Saharan Africa establishes that digital financial infrastructure has expanded income generating opportunities and reduced transaction costs for rural households, even though its direct effects on poverty reduction remain contested in cross country panel analysis (Grzybowski, Lindlacher, & Mothobi, 2023). Network coverage is repeatedly identified as the binding constraint on mobile money and, by extension, mobile based e voucher adoption. Mothobi and Kebotsamang (2024) show that expanding network coverage is associated with significantly higher fintech adoption across Sub-Saharan Africa, while Moyo, Zimusi, Ncube, and Kupfurwa (2022) document that even in relatively remote mining communities, mobile money usage rises sharply once basic connectivity and agent liquidity are assured. These findings imply that Malawi's earlier e voucher pilots may have failed less because of conceptual flaws than because they were introduced before telecommunications infrastructure could support full scale redemption, a sequencing error rather than a design error.

Direct evidence from comparable input subsidy reforms reinforces this interpretation. Nigeria's e voucher based fertilizer subsidy programme, which distributed vouchers directly to registered mobile numbers, produced measurable reductions in ghost beneficiary claims once biometric confirmation was required at the point of redemption, although Kijima (2022) also found that the programme's effect on aggregate fertilizer use was muted in areas where private commercial input markets were already well developed, illustrating a crowding out effect that Malawian planners should anticipate rather than ignore. Ghana's Planting for Food and Jobs programme similarly combined mobile registration with subsidized input distribution and achieved faster delivery timelines in districts with stronger telecommunications and agro dealer networks, but implementation quality varied enough across regions that national level impact evaluations

produced more modest average effects than pilot studies had suggested (Pauw, 2022). Taken together, this comparative literature supports a second proposition.

2.4 Information and Communication Technologies in Smallholder Agriculture

A parallel literature on information and communication technology adoption among smallholder farmers offers further support for a digitally mediated subsidy model, while also cautioning against overstating its reach. Systematic reviews applying the Technology Acceptance Model to mobile agricultural service applications across Sub-Saharan Africa find generally positive associations between perceived usefulness, ease of use, and sustained adoption, but note that adoption plateaus quickly where infrastructure, digital literacy, or device access remain uneven (Erlangga, Machuku, & Dahino, 2023). Evidence from South Africa's Eastern Cape shows that mobile phone based information systems can measurably enhance smallholder productivity and food security outcomes when farmers receive adequate training alongside the technology itself Mdoda, Christian, and Agbugba (2024), while a study of grape farmers in Dodoma, Tanzania found that awareness and habitual use of mobile services for market information were stronger predictors of benefit realization than device ownership alone (Nyagango, Sife, & Kazungu, 2023). These findings collectively suggest that Malawi's proposed digital reform cannot rely on technology deployment alone. It must be accompanied by farmer facing digital literacy support, particularly given that a substantial majority of Malawian FISP beneficiaries do not own smartphones and would need to rely on basic USSD interfaces (Food & Agriculture, 2024).

2.5 Transparency, Logistics, and Accountability

The third documented failure in FISP concerns the opacity of input procurement and distribution logistics, which has historically made it difficult for oversight bodies, journalists, or farmers themselves to identify where in the supply chain delays or diversions were occurring. The digital governance literature offers a reasonably consistent answer to this problem in the form of public facing dashboards and e government platforms that expose real time performance data to citizens and oversight institutions. Shibambu (2024) documents that the transformation of digital government services within South Africa's public sector has been associated with measurable gains in transparency and accountability where dashboards were paired with clear institutional ownership, while Nkgapele and Mokgolobotho (2024) similarly find that accessible e government services improve citizen trust when platforms are designed around actual user needs rather than administrative convenience alone. Transparency International's own regional guidance on agricultural subsidy governance explicitly recommends real time public reporting of input stock levels and distribution progress as a central pillar of anti corruption reform in this sector (Transparency International, 2022). These findings motivate the third and final proposition guiding this study.

2.6 Synthesis and Conceptual Framework

Read together, this literature suggests that FISP's three principal failures, namely elite captured targeting, delayed and leakage prone distribution, and opaque logistics, are not independent problems requiring separate remedies but interlocking symptoms of a single underlying weakness, which is the absence of verifiable, real time information flowing between beneficiaries, implementing agencies, and oversight bodies. Biometric registration addresses the information gap at the point of eligibility determination. Mobile money based e vouchers address the information gap at the point of redemption. Public logistics dashboards address the information gap across the supply chain as a whole. This framing implies that partial reform, such as digitizing redemption without also reforming targeting, is likely to reproduce old failures in new form, a pattern consistent with Malawi's own experience of piloting e vouchers without addressing the underlying beneficiary list problem. The three propositions developed above are therefore treated in this study not as independent hypotheses to be tested in isolation but as complementary components of a single reform architecture whose effectiveness depends substantially on sequencing and joint implementation.

3. Methodology

This study adopts a qualitative, comparative document analysis design rather than a primary quantitative evaluation, a choice dictated by the fact that Malawi's proposed digital reform has not yet been implemented and therefore generates no household level outcome data of its own. The analytical approach instead follows the logic of an evidence synthesis review, in which documented outcomes from structurally comparable interventions in other countries and from Malawi's own earlier pilots are systematically compared against the three propositions developed in section two.

Data sources fall into three categories. The first comprises peer reviewed journal articles and book chapters addressing agricultural input subsidy administration, digital identification, mobile money adoption, and public sector transparency, drawn primarily from Scopus indexed and internationally recognized journals published between 2021 and 2026, supplemented by a small number of earlier foundational studies on FISP's original design and early performance that remain the most authoritative sources on that period. The second category comprises independent programme evaluations and government reports, including the World Bank's Malawi Public Expenditure Review, the Ministry of Agriculture's own review of its 2015 or 2016 e voucher pilot, and Transparency International's governance framework for agricultural subsidy reform. The third category comprises comparative country evidence on digital input subsidy reform from Nigeria, Ghana, Kenya, Tanzania, and Zambia, selected because each has implemented some combination of biometric registration, mobile money redemption, or logistics digitization within an agricultural subsidy programme structurally similar to FISP.

Search terms combined variations of farm input subsidy, e voucher, biometric registration, proxy means test, mobile money, and digital government service delivery, applied across Google Scholar, Scopus, and institutional repositories including the World Bank Open Knowledge Repository and the Institute of Development Studies publication archive. Sources were included where they reported empirical findings, programme evaluation data, or documented implementation experience relevant to at least one of the three propositions; purely theoretical or opinion based commentary without an empirical or evaluative component was excluded unless it provided essential contextual or historical background on FISP itself.

Analysis proceeded thematically. Each retained source was coded according to which of the three propositions it addressed, whether its reported findings supported, partially supported, or contradicted the proposition, and what contextual conditions, such as network coverage, institutional capacity, or private market density, appeared to moderate the outcome. This coding was then synthesized narratively in section four, with particular attention to conditions under which digital interventions succeeded or failed in comparator countries, since those conditions carry direct implications for how Malawi should sequence its own reform. This method is inherently interpretive rather than statistical, and its limitations, particularly regarding causal inference and the transferability of findings across institutional contexts, are addressed explicitly in section five.

4. Results and Discussion

4.1 Evidence on Beneficiary Targeting

The synthesized evidence lends reasonably strong support to Proposition One, though with an important qualification concerning implementation sequencing. Malawi's own documented experience shows that community administered targeting under the Area Development Committee model produced substantial elite capture, with wealthier households in some study districts receiving coupons more than twice as often as the poorest quintile (Ricker-Gilbert et al., 2011; Chibwana et al., 2012). This pattern is not unique to Malawi. Cross country evidence on proxy means testing shows that targeting accuracy improves materially when eligibility determination is separated from local committee discretion and instead anchored in a verifiable, centrally administered registry (Banerjee et al., 2024; Areias & Wai-Poi, 2022). Tanzania's experience under its national social protection programme, in which an independent targeting mechanism replaced community committee discretion, is frequently cited as a comparator model precisely because it

demonstrates that removing local override authority, rather than simply digitizing the existing process, is the operative mechanism behind improved targeting accuracy.

The qualification concerns biometric data quality and inclusion error. Country case evidence compiled across ten African biometric identification programmes finds that systems introduced without adequate attention to data protection, consent, and interoperability with existing civil registries risk excluding legitimate beneficiaries whose biometric data cannot be reliably captured or matched, particularly among elderly or manual laboring populations whose fingerprints are often degraded. This finding is directly relevant to Malawi, where a large share of FISP's target population consists of elderly headed households, precisely the group most likely to experience biometric capture difficulties. The evidence therefore supports Proposition One conditionally: biometric registration paired with independent targeting adjudication is likely to reduce elite capture and duplicate enrollment, but only if the system incorporates a functioning appeals process and alternative verification pathways for households whose biometric data cannot be reliably captured on the first attempt.

4.2 Evidence on Mobile Money E Vouchers and Distribution Timing

Support for Proposition Two is similarly substantial but conditional on infrastructure readiness. FAO's regional review of digital subsidy systems found average leakage reductions in the range of one third and distribution timeline compressions of roughly two thirds in countries that paired mobile money redemption with biometric confirmation at agro dealer points, though these gains were concentrated in districts with adequate network coverage and liquid mobile money agents (Food & Agriculture, 2024). Nigeria's experience offers a instructive counterpoint. While ghost beneficiary redemption fell measurably after the introduction of mobile number linked vouchers, Ohiorhenuan, Fengler, and Raju (2021) analysis found no significant increase in aggregate fertilizer application in areas where private commercial fertilizer markets were already well established, because subsidized input simply substituted for input farmers would otherwise have purchased commercially. This crowding out dynamic is not an argument against digitization, but it is an important caution against expecting mobile money based e vouchers to raise aggregate input use in districts where private markets are already functioning reasonably well; the more defensible expected benefit in such contexts is leakage reduction and faster delivery rather than higher total fertilizer application.

The underlying infrastructure literature reinforces why Malawi's earlier pilots underperformed. Network coverage is consistently identified as the binding constraint on mobile money adoption across Sub-Saharan Africa, with coverage expansion associated with sharply higher fintech and mobile money usage even after controlling for income and education (Mothobi, & Kebotsamang, 2024; Grzybowski, Lindlacher, & Mothobi, 2023). Malawi's 2015 or 2016 e voucher pilot was introduced at a time when rural network coverage was considerably more limited than it is today, which helps explain why the pilot could not scale nationally even though it demonstrated leakage reduction where it did operate (Ministry & Water, 2017). Given that approximately seventy eight percent of Malawians lack smartphones, a USSD based redemption channel, rather than a smartphone application alone, appears essential to reaching the majority of FISP's target population, a design choice supported by evidence that basic USSD interfaces achieve comparable adoption to smartphone applications among lower income rural users once awareness and habitual use are established (Nyagango, Sife, & Kazungu, 2023).

4.3 Evidence on Logistics Transparency and Accountability

Evidence in support of Proposition Three is more limited in volume than for the first two propositions, reflecting a smaller empirical literature on agricultural logistics dashboards specifically, but the adjacent literature on digital government transparency initiatives is directly relevant and reasonably consistent. Walls and Matita (2023) study of digital government service transformation in South Africa's public sector found that dashboards and digitized reporting systems improved transparency and accountability primarily where institutional ownership of the platform was clearly assigned and where reported data were genuinely acted upon by oversight bodies, rather than simply published. Nkgapele and Mokgolobotho (2024) reached a similar conclusion regarding

citizen facing e government services more broadly, finding that transparency gains depended on platforms being designed around what citizens and oversight actors actually needed to monitor, rather than around administrative convenience. Applied to FISP, this suggests that a district level public dashboard reporting input stock levels, distribution progress, and redemption rates, as recommended in Transparency International's governance framework for agricultural subsidy reform Transparency (2022), is likely to strengthen accountability, but its success will depend heavily on which government body owns the dashboard and whether civil society and parliamentary oversight structures are positioned to act on the information it reveals.

4.4 Fiscal and Institutional Considerations

Beyond the three propositions themselves, the broader governance literature on corruption in African public procurement offers a cautionary frame for interpreting these results. Mutsvairo and Kalinga (2022) argue that digital reforms which reduce opportunities for petty leakage at the point of service delivery can nonetheless leave upstream procurement and contracting stages vulnerable to capture if those stages are not reformed in parallel. This is directly relevant to FISP's proposed logistics reform, since input pre-positioning contracts and private transporter agreements represent exactly the kind of upstream procurement stage that digital dashboards alone will not necessarily discipline unless performance bonds and competitive tendering are also strengthened. The fiscal modeling embedded in Malawi's own reform proposal, which anticipates that transitional investment of roughly twenty eight million United States dollars could generate savings of approximately forty two million dollars over the reform period through leakage reduction alone (Chirwa & Dorward, 2013; World Bank, 2023). It is broadly consistent with the leakage reduction magnitudes documented in comparator countries, but it should be treated as an upper bound rather than a guaranteed outcome, given that comparator experiences show gains concentrated in areas with adequate infrastructure and strong institutional ownership rather than distributed evenly across all implementation contexts.

Table 1. Proposed three-phase digital reform of the farm input subsidy programme

Phase	Timeline	Digital Component	Proposition Addressed	Principal Risk
Phase 1: Foundation	2026	Biometric beneficiary registry and independent targeting commission	Proposition One	Biometric data quality and exclusion of elderly beneficiaries
Phase 2: Digitalization	2027	Mobile money e-voucher redemption via USSD and smartphone channels	Proposition Two	Uneven network coverage and agro dealer liquidity
Phase 3: Logistics Reform	2028-2029	Input pre-positioning, performance bonded transport, public dashboard	Proposition Three	Persistent upstream procurement capture

Table 1 summarizes the three phase reform architecture implied by this evidence synthesis, showing how each phase corresponds to one of the three propositions examined above and indicating the principal risk that comparator country evidence associates with each phase. The Table 1 summarizes the proposed three phase digital reform of Malawi's Farm Input Subsidy Programme. Phase one, covering the 2026 agricultural season, establishes a biometric beneficiary registry administered by an independent targeting commission rather than by Area Development Committees, directly addressing Proposition One; the principal risk identified in comparator literature is biometric data quality and the exclusion of elderly or manually laboring beneficiaries whose fingerprints are difficult to capture. Phase two, covering the 2027 season, introduces mobile money based e voucher redemption through USSD and smartphone channels, addressing Proposition Two; the principal risk is uneven network coverage and agro dealer liquidity across districts. Phase three, covering the 2028 and 2029 seasons, introduces input pre positioning warehouses, performance bonded transport

contracts, and a public logistics dashboard, addressing Proposition Three; the principal risk is that upstream procurement capture may persist unless competitive tendering and performance bonds are enforced alongside the dashboard itself.

4.5 Discussion

Taken together, the results suggest that Malawi's repeated difficulty in sustaining digital FISP reform reflects a sequencing problem more than a technology problem. Each of the three propositions receives support from comparator evidence, yet each is also conditioned on institutional or infrastructural prerequisites that Malawi's earlier pilots did not fully satisfy. The 2015 or 2016 pilot attempted digitized redemption before network coverage could support it. Subsequent district level pilots in Lilongwe, Mchinji, and Kasungu demonstrated feasibility at small scale but were never paired with the targeting reform or logistics transparency measures that the wider literature suggests are necessary for full national impact. This pattern is consistent with the broader finding in the digital government literature that partial digitization, implemented without institutional ownership or complementary reform, tends to produce smaller and less durable gains than comprehensive reform undertaken in a deliberately sequenced order (Shibambu, 2024). The phased approach summarized in Table 1, which addresses targeting, redemption, and logistics in sequence rather than simultaneously, is therefore not merely an administrative convenience but a design choice supported by the comparative evidence reviewed in this study.

5. Conclusions

5.1 Conclusion

The Farm Input Subsidy Programme remains the single most important instrument available to the Malawian state for protecting smallholder food security, yet two decades of documented leakage, elite capture, and delivery delay have prevented it from delivering value commensurate with its fiscal cost. This study synthesized evidence from Malawi's own programme history alongside comparable digital reforms in Nigeria, Ghana, Tanzania, Kenya, and Zambia to evaluate whether a coordinated programme of biometric beneficiary registration, mobile money based e voucher redemption, and public logistics dashboards could address these failures. The evidence supports a cautiously optimistic conclusion. Biometric registration administered by an independent targeting body can reduce elite capture and duplicate enrollment provided that data quality safeguards and appeals mechanisms protect against new exclusion errors. Mobile money based redemption can reduce leakage and compress distribution timelines provided that network coverage and agro dealer liquidity are adequate in the districts where it is deployed. Public dashboards can strengthen accountability provided that institutional ownership is clearly assigned and oversight bodies are positioned to act on the information such platforms reveal. None of these interventions is likely to succeed in isolation, and Malawi's own history of piloting redemption digitization without parallel targeting or logistics reform offers a clear illustration of why sequencing and institutional completeness matter as much as the technology itself.

5.2 Research Limitations

This study is subject to several limitations that should temper the confidence with which its conclusions are applied. The analysis relies entirely on secondary and comparative evidence rather than primary household level data collected within Malawi's own FISP beneficiary population, since the proposed digital reform architecture has not yet been implemented nationally and therefore generates no outcome data of its own. The comparator evidence drawn from Nigeria, Ghana, Tanzania, Kenya, and Zambia, while structurally informative, reflects institutional, infrastructural, and political contexts that differ from Malawi's in ways that may limit the direct transferability of magnitude estimates, even where the underlying mechanisms are plausibly similar. The qualitative thematic coding method used to synthesize this literature, while systematic, necessarily involves interpretive judgment regarding which findings support, partially support, or contradict each proposition, and a different research team applying the same method might reach somewhat different characterizations of ambiguous cases. Finally, the fiscal savings estimates referenced in this study originate from Malawi's own prior policy modeling rather than from an

independent cost benefit analysis conducted as part of this research, and should therefore be treated as indicative rather than definitive.

5.3 Suggestions and Directions for Future Research

Future research should prioritize three directions once Malawi's digital reform begins phased implementation. First, a rigorous impact evaluation using a randomized or quasi experimental design across districts phased into the biometric registry at different times would allow the leakage and targeting accuracy claims examined in this study to be tested directly against Malawian household level outcomes rather than inferred from comparator countries. Second, research specifically addressing biometric data quality and exclusion error among elderly and manually laboring populations in the Malawian context would help refine the appeals and alternative verification mechanisms that this study identifies as necessary safeguards. Third, longitudinal research tracking whether public logistics dashboards are actually used by civil society organizations, journalists, and parliamentary oversight committees, rather than simply published and left unexamined, would help clarify whether the accountability gains documented in comparator digital government literature actually materialize in Malawi's specific institutional environment. Such research would allow future revisions of this policy relevant literature to move from the comparative and propositional evidence synthesis undertaken here toward direct causal evaluation grounded in Malawi's own reform experience.

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