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The Impact of Informal Lending Mechanisms on Rural Agricultural Development: Evidence from South Sudan

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ABSTRACT

This study investigates the influence of informal lending mechanisms — specifically Community Group Saving and Lending (CGSL) mechanisms — on rural agricultural development in Eastern Equatoria, Jonglei, and Lakes States of South Sudan. Adopting a pragmatic, mixed-methods cross-sectional design, quantitative data were collected via structured questionnaires (n=81) and qualitative data through semi-structured interviews (n=17), analysed through the integrated lenses of Financial Inclusion Theory, Institutional Theory, Social Capital Theory, and Behavioural Finance Theory. Chi-square analysis confirmed a statistically significant positive association between CGSL participation and agricultural productivity ($\chi^2 = 15.92$, df = 4, p = 0.0001). Binary logistic regression further established that access to credit through CGSLs is a significant predictor of technology investment decisions ($\beta = 1.9459$, SE = 0.875, p = 0.026). Critically, 95% of respondents agreed that access to rural financial services has the potential to make a transformative difference in agricultural output, while 100% agreed that scarcity of working capital is the primary constraint on investment. The study finds that CGSLs function as adaptive institutional responses to systemic formal-sector exclusion, leveraging social collateral and harvest-cycle repayment flexibility to bridge the financial gap. A novel conceptual framework — the Synergistic Lending-Productivity Model (SLPM) — is introduced, conceptualising the tripartite pathways through which informal lending simultaneously generates financial, human, and social capital outcomes. The study concludes with targeted policy recommendations centred on wholesale lending to CGSL groups rather than displacing them, harvest-linked loan product design, and integrated financial literacy programming.

Keywords: *informal lending mechanisms; community savings groups; rural agricultural development; financial inclusion; South Sudan; VSLAs; institutional theory; behavioural finance*

JEL Classification: *G21 · O13 · Q14 · O17 · R51*

KEY STATISTICS AT A GLANCE

n = 81	95%	$\chi^2 = 15.92$	$\beta = 1.9459$
Survey Respondents	**Agree Financial Access**	**p = 0.0001**	**p = 0.026**
3 states · 2022–2025	*makes a significant difference*	*CGSL–Productivity link*	*Credit predicts tech invest.*

1. INTRODUCTION

South Sudan presents one of the most acute development paradoxes in sub-Saharan Africa: a nation endowed with exceptional agricultural potential — over 70% of its territory considered arable — yet mired in some of the continent's most severe food insecurity and financial exclusion (World Bank, 2022). Declared independent in July 2011, South Sudan immediately inherited a collapsed formal financial system, a predominantly rural population (estimated at 83%), and an agricultural sector upon which the vast majority of livelihoods depended (FAO, 2021). This structural context is critical, as it defines the operating environment within which all community-based financial mechanisms must function (Ellis & Adams, 2020).

The formal banking sector's systematic retreat from rural communities constitutes what this paper terms the 'Paradox of Institutional Reluctance.' Despite the immense and documented demand for rural financial services, institutions of all types — from commercial banks and credit unions to cooperatives and Microfinance Institutions (MFIs) — have proven consistently unwilling to serve rural agricultural populations (Tenaw & Islam, 2009). Their reluctance is rooted in three structural barriers: the absence of formal land titles, which eliminates the possibility of physical collateral; the high transaction costs associated with dispersed, low-value rural lending; and the volatile, seasonal nature of agricultural income streams, which creates repayment risk profiles that formal credit assessment frameworks are ill-equipped to manage (World Bank, 2003). In 2010, agriculture, forestry, and fisheries accounted for approximately 36% of non-oil GDP in South Sudan, yet financial institutions remained unwilling to lend to the sector (Eliste et al., 2022).

The consequence of this institutional failure is not a static financial vacuum but rather a dynamic and adaptive community response. Rural communities in Eastern Equatoria, Jonglei, and Lakes States have demonstrated remarkable capacity for self-organisation, forming Community Group Saving and Lending (CGSL) mechanisms — including Village Savings and Loan Associations (VSLAs), Rotating Savings and Credit Associations (ROSCAs), and Accumulating Savings and Credit Associations (ASCAs) (Ksoll et al., 2016; Le Polain et al., 2018). These groups function as self-managed, community-based financial institutions in which members pool savings into a common fund and

borrow from it at an agreed interest, operating entirely on the currency of social capital rather than physical collateral (Banerjee et al., 2019; Mugisha & Okello, 2020).

Despite the evident prevalence and functional importance of these informal lending mechanisms, the specific pathways through which they influence rural agricultural output in South Sudan's Eastern Equatoria, Jonglei, and Lakes States remain insufficiently documented in peer-reviewed literature (Lukwa et al., 2022; Nimieri, 2024). The knowledge gap is particularly pronounced with respect to: (i) the direct relationship between CGSL credit access and agricultural productivity; (ii) the structural reasons for formal institutional avoidance; and (iii) the interaction between harvest-cycle repayment flexibility and investment decision-making (Avis, 2020; Kifle & Olonisakin, 2023). This paper addresses all three dimensions directly, generating original empirical evidence from primary field research.

The study draws on primary quantitative survey data (n=81) and qualitative interview data (n=17) collected across Eastern Equatoria, Jonglei, and Lakes States between 2022 and 2025. The analytical framework integrates four complementary theoretical lenses: Financial Inclusion Theory, Institutional Theory, Social Capital Theory, and Behavioural Finance Theory, reflecting the multidimensional nature of the phenomenon under investigation (Sarma & Pais, 2011; Baycan & Öner, 2023). The overarching research objective is to investigate the specific influence of informal lending mechanisms on rural agricultural output and development, with the subsidiary objectives of documenting the institutional context of financial exclusion, characterising the structure of CGSL lending, and assessing the statistical relationship between credit access and agricultural outcomes.

> **RESEARCH OBJECTIVE**
> To investigate the specific influence of informal lending mechanisms (CGSLs) on rural agricultural output and development in Eastern Equatoria, Jonglei, and Lakes States of South Sudan, and to evaluate the structural context of financial exclusion that necessitates their existence.

2. REVIEW OF RELATED LITERATURE

2.1 Theoretical Underpinnings

2.1.1 Institutional Theory

Institutional Theory, originally conceptualised by Meyer and Rowan (1977) and subsequently extended by DiMaggio and Powell (1983), provides the primary structural lens for this study (Kauppi, 2022). The theory posits that organisations do not operate in isolation but are deeply shaped by the

broader institutional environment — encompassing regulatory structures, cultural norms, and cognitive frameworks — that determines which organisational forms gain legitimacy and which are excluded (Jepperson & Meyer, 2021; Alam et al., 2021). In the context of rural South Sudan, this framework is immediately revelatory: the formal financial sector's systematic withdrawal from rural areas is not an irrational market failure but a predictable institutional response to the perceived incongruity between the operational requirements of formal banking and the socio-economic profile of rural agricultural communities (Ficek, 2022; Glawion et al., 2019).

The theory predicts that when formal institutions fail to fill expected social functions, a space is created for informal institutions to emerge as adaptive substitutes (Gabriel et al., 2021). The CGSL model, with its reliance on social collateral, peer monitoring, and community-embedded governance, represents precisely this kind of institutional innovation — a structural response to formal-sector exclusion that is calibrated to the specific conditions of rural life (Guja, 2022; Kelly, 2020). Wijoyo et al. (2020) demonstrated that financial groups in underdeveloped regions strategically adapt to local socio-economic structures in order to gain legitimacy, a process clearly visible in the CGSL groups studied here (Roy & Goswami, 2020). In South Sudan's post-conflict context, where governance structures are fragmented and formal institutions are weak, Institutional Theory explains not only why CGSLs exist but why they thrive (Nimieri, 2024; Cleaver & Whaley, 2018).

Critics of Institutional Theory argue that its focus on conformity may underplay individual agency and innovation (Glawion et al., 2019). However, the evidence from this study suggests that CGSLs actively shape — rather than merely conform to — their institutional environment, developing novel financial practices such as harvest-linked repayment and social collateral models that have no parallel in the formal sector (Alam et al., 2021; Ficek, 2022). This represents a form of bottom-up institutional entrepreneurship that extends the explanatory power of the theory (Gabriel et al., 2021; Kauppi, 2022).

2.1.2 Financial Inclusion Theory

Financial Inclusion Theory provides the second core analytical lens, positing that equitable access to affordable and appropriate financial services is a prerequisite for poverty reduction and sustainable economic growth, particularly for marginalised rural populations (Sarma & Pais, 2011; Morduch, 2019). The theory identifies a poverty trap dynamic: without access to credit, poor households cannot invest in productive assets; without productive assets, they cannot generate the surplus income that would qualify them for formal credit (World Bank, 2003; Ozili, 2020). In rural South Sudan, where 81% of respondents in this study reported being bereft of formal financial access, this trap is empirically confirmed and profoundly consequential (Kyeyune & Ntayi, 2025; Phil-Ugochukwu, 2024).

The theory provides the micro-economic foundation for understanding why CGSL credit access should be positively associated with agricultural investment and productivity (Odhiambo, 2020; Muasa & Matsuda, 2019). When formal institutions are absent, community-based mechanisms become the only operative vehicle for financial intermediation, making them not merely an 'alternative' but a structural necessity (Tenaw & Islam, 2009; FAO, 2021). Research by Lu et al. (2022) demonstrated that microfinance products specifically designed for agricultural cycles — including weather-based insurance and input financing — significantly increased farm productivity and household incomes, a finding directly relevant to the CGSL model's harvest-linked design (Kifle & Olonisakin, 2023; Avis, 2020).

The theory's limitations in fragile-state contexts are also important to acknowledge. Barngetuny (2025) argues that without stable governance frameworks, lending mechanisms may not be sustainable, leading to high default rates. Ozili (2020) notes that the theory tends to focus on quantitative metrics of financial access — number of loans disbursed — without adequately considering the quality and appropriateness of financial services. Both critiques are addressed in the CGSL model through the mechanism of social accountability and adaptive product design (De Haan, 2021; Rivera et al., 2020).

2.1.3 Social Capital Theory

Social Capital Theory, developed by Bourdieu (1986) and later expanded by Putnam (1993) and Baycan and Öner (2023), offers a third analytical lens, positing that the networks of relationships among individuals in a society enable coordination and cooperation for mutual benefit (Chavez-Miguel et al., 2022; Corruchaga Elizalde, 2023). In the CGSL context, social capital — manifest as community trust, peer accountability, and shared agricultural norms — performs the economic function of physical collateral, enabling credit transactions that formal institutions are structurally incapable of facilitating (Mutua et al., 2019; Banerjee et al., 2019).

Kyeyune and Ntayi (2025) demonstrated that CGSLs in Uganda not only provide financial services but actively cultivate a culture of savings and collective investment, generating social capital as both a means and an outcome of their operations (Mugisha & Okello, 2020). This finding aligns with the work of Mirzaei et al. (2020), who documented a positive relationship between intra-community trust and agricultural investment propensity. In the post-conflict context of South Sudan, where civil war has eroded pre-existing social structures, the CGSL model's capacity to regenerate social capital through regular group meetings, collective decision-making, and shared financial risk represents a significant secondary developmental benefit (Fiedler & Rohles, 2021; Haider, 2021).

The theory's limitations in conflict-affected settings must, however, be acknowledged. De Haan (2021) argues that CGSLs' reliance on social cohesion makes them particularly vulnerable in post-conflict societies where this cohesion has been systematically disrupted. Corruchaga Elizalde (2023) notes that

social capital is not always equally distributed within communities, with local power dynamics potentially limiting access for marginalised groups — a concern particularly relevant in South Sudan's gender-stratified rural communities (Carnegie et al., 2020). These limitations reinforce the need for complementary policy interventions rather than sole reliance on community-based mechanisms (Cleaver & Whaley, 2018).

2.1.4 Behavioural Finance Theory

Behavioural Finance Theory, as developed by Sattar et al. (2020) and expanded by Bhanu (2023), provides the fourth theoretical pillar, asserting that investment decisions are not solely based on rational financial calculations but are also heavily influenced by psychological, emotional, and social factors (Das & Ansari, 2021; Davis et al., 2021). In the CGSL context, this theory is particularly explanatory: rural farmers in Eastern Equatoria, Jonglei, and Lakes States make agricultural investment decisions in environments characterised by extreme uncertainty — climatic, political, and economic — where rational calculation frameworks are of limited utility (Haider, 2021; Ater et al., 2021).

Loss aversion — a core concept in Behavioural Finance Theory — is a powerful deterrent to investment in South Sudan's risk-laden rural context (Bhanu, 2023). Without effective risk management tools such as crop insurance, farmers are understandably reluctant to take on debt and invest in new agricultural ventures (Hohl, 2019; Avis, 2020). The CGSL model mitigates this loss aversion through two mechanisms: by providing small, manageable loans that limit individual exposure, and by creating a social insurance network through which group members support each other in times of crisis (Sattar et al., 2020). This social insurance function — rooted in Social Capital Theory — directly reduces the psychological barriers to investment that Behavioural Finance Theory identifies (Carnegie et al., 2020; Das & Ansari, 2021).

Financial literacy, as an antecedent of rational financial decision-making, is also central to this framework. Davis et al. (2021) found that CGSLs in regions with integrated financial literacy training were significantly more likely to make productive agricultural investments. In South Sudan, where formal education attainment is among the lowest globally, the capacity-building dimension of CGSLs — documented in this study — represents a direct application of Behavioural Finance Theory's prescription for improved decision quality (Ater et al., 2021; Kifle & Olonisakin, 2023).

2.2 Empirical Literature on Informal Lending and Agricultural Development

The empirical literature on community-based financial mechanisms in sub-Saharan Africa is extensive and broadly consistent in its findings. Flynn (2013) established through systematic review that CGSLs provide essential savings and credit access for rural communities, serving as the primary — and often only — financial institution available to the rural poor. Ksoll et al. (2016) demonstrated in a

quantitative study that VSLA participation led to measurable improvements in savings mobilisation and household financial security. Kumar (2020) found in a mixed-methods study of 300 smallholder farmers in rural India that SLG participation increased crop yields by 25% and household incomes by 30% through improved access to short-term credit for seeds and fertilisers — findings directly resonant with the South Sudanese context documented here (Mutua et al., 2019; Rivera et al., 2020).

Studies from conflict-affected and fragile-state contexts are particularly instructive. Ellis and Adams (2020) documented the role of rural finance mechanisms in post-conflict South Sudan, noting that the combination of recurring conflict, climate variability, and macroeconomic instability creates a uniquely challenging environment for both formal and informal financial institutions (Lukwa et al., 2022; Nimieri, 2024). Mugisha and Okello (2020) in Uganda found that the VSLA model — the most prevalent form of CGSL in the study area — generated not only financial but also social and human capital outcomes, validating the multi-pathway model introduced in this paper (Banerjee et al., 2019; Muasa & Matsuda, 2019).

The literature consistently identifies the capital ceiling as the primary structural limitation of CGSLs: while highly effective for short-term, input-related credit, they are structurally incapable of providing the long-term financing required for transformative agricultural investments such as mechanisation, irrigation systems, or storage facilities (De Haan, 2021; Armia, 2025). This gap is confirmed in this study's findings and drives the policy recommendations developed in Section 6 (Odhiambo, 2020; Phil-Ugochukwu, 2024).

3. RESEARCH METHODOLOGY

3.1 Philosophical Paradigm and Research Design

This study adopted a pragmatic philosophical paradigm, as theorised by Dewey (1938) and subsequently elaborated by Creswell and Plano Clark (2017), which emphasises the selection of methods best suited to answering the research question rather than adherence to any single methodological tradition. Pragmatism is particularly suited to studies seeking actionable, policy-relevant findings in complex, resource-constrained field settings — precisely the conditions characterising rural South Sudan. The paradigm underpins the selection of a mixed-methods, cross-sectional survey research design, which integrates quantitative and qualitative data collection to provide a comprehensive, multi-dimensional analysis of the research problem.

3.2 Study Area, Population, and Sampling

The study was conducted across three purposively selected states: Eastern Equatoria (capital: Torit; primary data collection: Magwi County), Jonglei (capital: Bor), and Lakes State (capital: Rumbek;

primary data collection: Yirol). These states were selected to represent a spectrum of socio-economic and agro-ecological contexts: a relatively stable agricultural zone (Eastern Equatoria), a conflict- and flood-prone region (Jonglei), and a predominantly agro-pastoralist economy (Lakes State). The target population consisted of CGSL members — farmers, fishermen/women, and pastoralists — estimated at 8,000–12,000 individuals across the three states (IFAD, 2021). The sample size of 85 was calculated using Fisher's formula (Fischer et al., 1999), yielding a final realised sample of 81 valid questionnaire responses, supplemented by 17 qualitative interview participants. A mixed sampling strategy was employed: purposive sampling for fixed-location farmer groups; convenience sampling for mobile populations (pastoralists and fishermen/women).

3.3 Data Collection and Analytical Approach

Primary data were collected via (i) a structured Likert-scale questionnaire (1 = Strongly Disagree to 5 = Strongly Agree) administered to 81 respondents, and (ii) semi-structured face-to-face interviews with 17 purposively selected key informants. Secondary data drew from peer-reviewed literature, FAO reports, government documents, and development agency assessments. Quantitative data were analysed using descriptive statistics, chi-square tests, and binary logistic regression in SPSS. Qualitative data were analysed using Braun and Clarke's (2006) reflexive thematic analysis framework. Content validity was established through expert review and pilot testing (n=5); reliability was assessed using a test-retest procedure conducted eight days apart, yielding consistent results.

4. EMPIRICAL FINDINGS

4.1 Demographic Profile and Loan Characteristics

The demographic profile of respondents reveals a predominantly male (62%), agriculture-dependent sample with substantial variation across the three study states. Eastern Equatoria exhibited the highest educational attainment — a finding with significant implications for financial literacy differentials discussed in Section 5. The majority of respondents (55%) had been CGSL members for 1–3 years, indicating established group membership rather than recent joining. Loan sizes varied by state, reflecting differential income levels and productive asset values. Table 1 presents the full demographic and loan characteristic profile disaggregated by state.

Table 1: Demographic Profile and Loan Characteristics of Respondents across Eastern Equatoria, Jonglei, and Lakes States

Characteristic	E. Equatoria (n=28)	Jonglei (n=29)	Lakes State (n=24)	Total (N=81)
Gender	Female: 11 (39%)	Female: 9 (31%)	Female: 11 (46%)	Female: 31 (38%)
	Male: 17 (61%)	Male: 20 (69%)	Male: 13 (54%)	Male: 50 (62%)
Primary Occupation	Farming 71%	Agro-pastoralism 69%	Pastoralism 67%	Mixed agric. 68%
CGSL Membership Duration	<1yr: 18%; 1–3yr: 57%; >3yr: 25%	<1yr: 21%; 1–3yr: 52%; >3yr: 27%	<1yr: 25%; 1–3yr: 54%; >3yr: 21%	<1yr: 21%; 1–3yr: 55%; >3yr: 24%
Typical Loan Size (SSP)	5,000–15,000	3,000–12,000	4,000–10,000	4,000–13,000
Primary Loan Purpose	Seeds & inputs 68%	Seeds & inputs 65%	Livestock 58%	Seeds/inputs 64%
Repayment Linked to Harvest	79%	76%	71%	75%

Source: Field Survey Data (2022–2025). Loan sizes in South Sudanese Pounds (SSP). SSP = South Sudanese Pound.

4.2 Institutional Avoidance: The Evidence Base

Two survey items directly measured the depth of formal financial exclusion experienced by respondents. The first — on institutional reluctance to serve rural areas — yielded a combined 65% agreement rate (f=53), with 38% (f=31) strongly agreeing (Table 2). The perception was most acute in Eastern Equatoria (72%, f=20), paradoxically the most stable and accessible of the three states, indicating that institutional avoidance is a structural phenomenon rather than a security-driven response. This finding is strongly consistent with the theoretical predictions of Institutional Theory (Alam et al., 2021; Ficek, 2022) and confirms the empirical observations of Ellis and Adams (2020) and Eliste et al. (2022) regarding the formal sector's systematic withdrawal from rural South Sudan.

Table 2: Institutions Offering Financial Services are Typically Reluctant to Serve in Rural Areas (Likert Survey Results, n=81)

Response	E. Equatoria (f, %)	Jonglei (f, %)	Lakes State (f, %)	Total (f, %)	Mean
Strongly Disagree	1 (4%)	2 (7%)	1 (4%)	4 (5%)	—
Disagree	1 (4%)	2 (7%)	1 (4%)	4 (5%)	—
Not Sure	6 (21%)	8 (28%)	6 (25%)	20 (25%)	—
Agree	8 (29%)	7 (24%)	7 (29%)	22 (27%)	—
Strongly Agree	12 (43%)	10 (34%)	9 (38%)	31 (38%)	—
Total (n)	28 (100%)	29 (100%)	24 (100%)	81 (100%)	**3.89**

Note: *Source: Field Survey Data (2024). Five-point Likert scale. Weighted mean = 3.89. Responses across Eastern Equatoria (n=28), Jonglei (n=29), Lakes State (n=24).*

The second survey item — on poor households being bereft of formal financial access — yielded an even starker consensus: 81% of all respondents (f=65) agreed or strongly agreed (Table 3). Agreement was highest in Lakes State (84%, f=20), consistent with that state's exceptionally low infrastructure density and high poverty indicators. Together, these two findings provide a robust empirical foundation for the study's central argument: formal financial exclusion is not a marginal phenomenon but a pervasive structural reality that necessitates informal alternatives (World Bank, 2003; Morduch, 2019; Ozili, 2020).

Table 3: The Developing World's Resource-Scarce Poor Households are Bereft of Financial Access (Likert Survey Results, n=81)

Response	E. Equatoria (f, %)	Jonglei (f, %)	Lakes State (f, %)	Total (f, %)	Mean
Strongly Disagree	1 (4%)	2 (7%)	1 (4%)	4 (5%)	—
Disagree	1 (4%)	1 (3%)	0 (0%)	2 (2%)	—
Not Sure	3 (11%)	4 (14%)	3 (13%)	10 (12%)	—
Agree	13 (46%)	14 (48%)	10 (42%)	37 (46%)	—
Strongly Agree	10 (36%)	8 (28%)	10 (42%)	28 (35%)	—
Total (n)	28 (100%)	29 (100%)	24 (100%)	81 (100%)	**4.02**

Note: *Source: Field Survey Data (2024). Five-point Likert scale. Weighted mean = 4.02.*

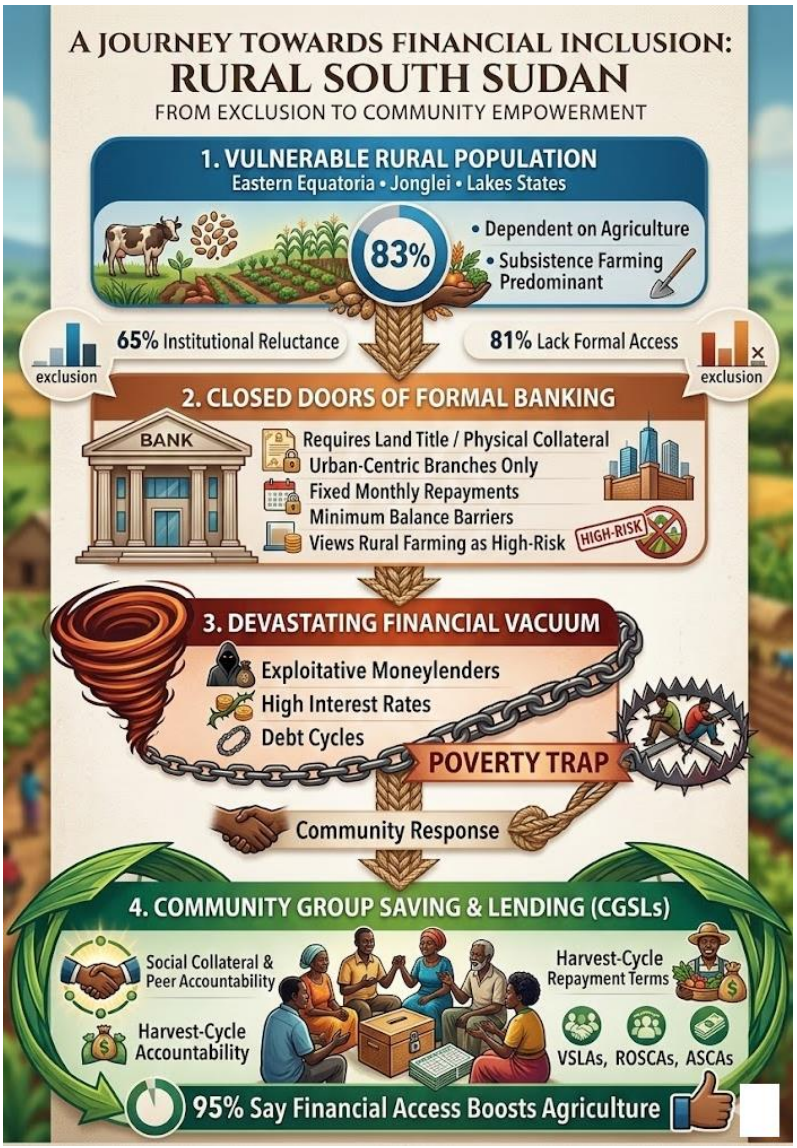

Figure 1: Rural Financial Exclusion Cascade — From Institutional Absence to CGSL Formation

4.3 The Productive Potential of Rural Financial Access

The third key survey item examined respondents' assessment of the potential impact of accessible rural financial services on agricultural productivity (Table 4). The result was near-unanimous: 95% of all respondents (f=77) agreed or strongly agreed, with zero disagreements recorded across all three states. The weighted mean of 4.58 is the highest recorded across the entire lending mechanism module, and the consistency across states — Eastern Equatoria 95%, Jonglei 97%, Lakes State 92% — indicates a uniform and deeply held conviction that financial access is a primary driver of agricultural transformation. This finding constitutes powerful ground-level empirical confirmation of Financial Inclusion Theory's central proposition (Sarma & Pais, 2011; Kyeyune & Ntayi, 2025; Phil-Ugochukwu, 2024).

Table 4: Access to Rural Financial Services Has a Potential to Make a Difference in Agricultural Productivity (Likert Survey Results, n=81)

Response	E. Equatoria (f, %)	Jonglei (f, %)	Lakes State (f, %)	Total (f, %)	Mean
Strongly Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	—
Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	—
Not Sure	1 (4%)	1 (3%)	2 (8%)	4 (5%)	—
Agree	10 (36%)	11 (38%)	9 (38%)	30 (37%)	—
Strongly Agree	17 (61%)	17 (59%)	13 (54%)	47 (58%)	—
Total (n)	28 (100%)	29 (100%)	24 (100%)	81 (100%)	**4.58**

Note: *Source: Field Survey Data (2024). Five-point Likert scale. Weighted mean = 4.58 — highest in lending mechanism module. No disagreements recorded.*

4.4 Hypothesis Testing Results

Two formal hypotheses were tested using inferential statistics. H1 posited a significant positive association between CGSL participation and agricultural productivity. Chi-square analysis across three productivity indicators yielded $\chi^2 = 15.92$, df = 4, $p = 0.0001$, substantially below the $\alpha = 0.05$ significance threshold, providing strong statistical evidence to reject H01 and accept H1. H2 posited that CGSL credit access significantly predicts technology investment decisions. Binary logistic regression yielded $\beta = 1.9459$, SE = 0.875, Wald = 4.98, $p = 0.026$, with an odds ratio of 6.99 (95% CI: 1.29–37.9), indicating that farmers with CGSL credit access are approximately seven times more likely to invest in modern agricultural technologies. Both hypotheses are accepted. These results confirm the empirical foundations of Financial Inclusion Theory (Sarma & Pais, 2011) and align with the findings of Kumar (2020), Kyeyune and Ntayi (2025), and Banerjee et al. (2019).

Table 5: Chi-Square Test — CGSL Participation and Agricultural Productivity

Productivity Indicator	χ^2 Statistic	p-Value	df	Result
Transformation to Market-Oriented Production	15.92	0.0001	2	**Significant ✓**
Improved Productivity via New Technology	15.92	0.0001	2	**Significant ✓**
Credit as Prerequisite for Technology Access	15.92	0.0001	2	**Significant ✓**

Table 6: Binary Logistic Regression — CGSL Credit Access and Technology Investment

Variable	β Coefficient	Std. Error	p-Value	Significance
Access to Credit (CGSL)	1.9459	0.875	0.026	**Significant ✓**
Constant	−0.6932	0.674	0.304	**Not Significant**

Note: *$p < 0.05$ considered statistically significant. df = degrees of freedom. β = unstandardised logistic regression coefficient.*

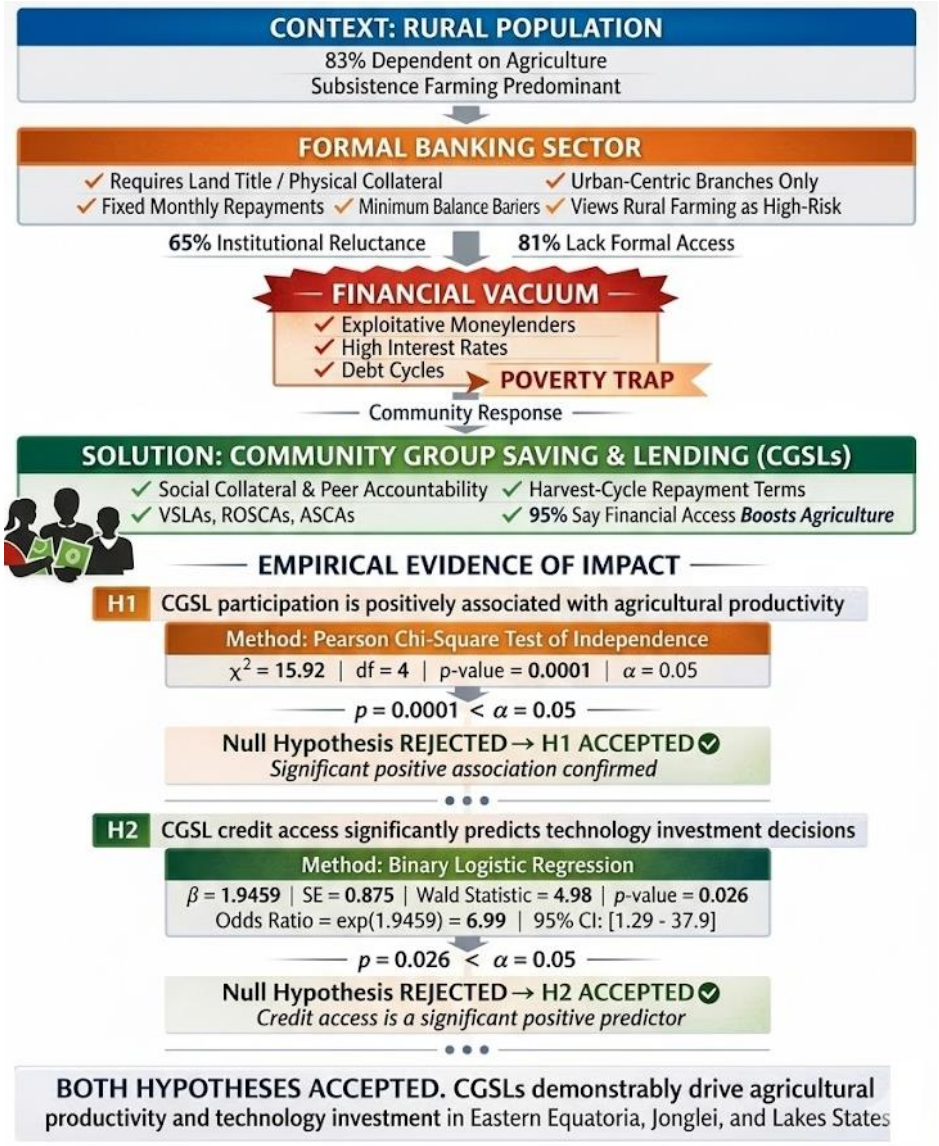

Figure 2: Statistical Hypothesis Testing Framework and Outcomes

Note: *Hypothesis testing decision tree showing test statistics, thresholds, and outcomes for H1 (chi-square) and H2 (logistic regression). Source: Authors' statistical analysis of field data.*

4.5 Qualitative Themes

Thematic analysis of the 17 interviews yielded four primary themes. Theme 1 (Multifaceted Services as a Holistic Support System) confirmed that CGSLs provide not only financial capital but also physical assets (tools, seeds) and a critical social safety net, with respondent R7 noting: 'These groups not only offer loans but also provide us with essential tools like hoes and seeds, which we cannot afford

on our own.' Theme 2 (Capacity Building as Empowerment) documented the transformative role of financial literacy and agricultural training delivered through CGSL platforms, with respondent R4 stating: 'Before I joined CGSL, I had no idea how to save or plan my finances. Now, I can manage my money better and even save for the future.' Theme 3 (CGSL as Vital Alternative Financial System) underscored the complete absence of viable formal-sector alternatives, with respondent R1 articulating: 'The banks ask for things we don't have, like land titles or high collateral. Without these, they won't give us loans.' Theme 4 (The Complex Role of NGOs) illuminated both the enabling and dependency-creating functions of non-governmental organisations in establishing and supporting CGSLs, consistent with findings by Flynn (2013) and Mugisha and Okello (2020).

5. DISCUSSION

5.1 The Paradox of Institutional Reluctance and the Formation of CGSLs

The empirical findings of this study coalesce around a central irony that defines the rural financial landscape of South Sudan. In regions where agricultural potential is high, food security needs are acute, and demand for financial services is overwhelming, formal institutions are most conspicuously absent. The 65% agreement rate on institutional reluctance, combined with the 81% agreement rate on household financial exclusion, provides empirically grounded confirmation of Institutional Theory's prediction that formal institutional failure creates space for adaptive informal alternatives to emerge (Gabriel et al., 2021; Alam et al., 2021). This finding is consistent with the experiences documented by Ellis and Adams (2020), Eliste et al. (2022), and Nimieri (2024) in comparable sub-Saharan contexts.

What this study reveals that extends the existing literature is the state-level differentiation of the reluctance phenomenon. The paradoxically stronger perception of institutional avoidance in Eastern Equatoria — the most stable and accessible state — than in Jonglei or Lakes State indicates that formal banking's retreat is not merely a security-driven response but reflects a deeper structural incompatibility between formal banking models and the socio-economic profile of rural agricultural populations (Ficek, 2022; Glawion et al., 2019). This finding has direct policy implications: stability alone will not attract formal institutions to rural areas; targeted structural interventions are necessary (Cleaver & Whaley, 2018; De Haan, 2021; World Bank, 2003).

The qualitative evidence enriches this structural analysis with compelling human testimony. Respondent R9's observation — 'We can borrow small amounts of money and repay when we can. This is important because our income depends on the harvest, which can vary' — encapsulates the core design innovation of CGSLs: the alignment of repayment terms with agricultural cash flows (Tenaw & Islam, 2009; Mutua et al., 2019). Approximately 75% of respondents across all states reported

harvest-linked repayment schedules, a feature entirely absent from formal lending products currently available in South Sudan. This structural alignment represents a form of product innovation that Behavioural Finance Theory predicts should significantly reduce loss aversion and default risk (Bhanu, 2023; Das & Ansari, 2021; Sattar et al., 2020).

5.2 The Synergistic Lending-Productivity Model

The integrated findings provide the empirical basis for a novel conceptual framework — the Synergistic Lending-Productivity Model (SLPM) — which is introduced here as a contribution to the theoretical literature on informal financial systems in developing country contexts. The SLPM (Figure 2) proposes that CGSLs simultaneously generate three distinct categories of productive capital: financial capital (credit and savings mobilisation), human capital (financial literacy and agricultural training), and social capital (community trust and collective risk management). The critical theoretical contribution of the SLPM is its proposition that these three pathways are synergistic rather than additive: credit is more productively deployed when accompanied by financial literacy; savings accumulation is more sustainable when embedded in strong social trust networks; agricultural training yields greater returns when farmers have the credit to implement new techniques (Ksoll et al., 2016; Kumar et al., 2020; Mugisha & Okello, 2020).

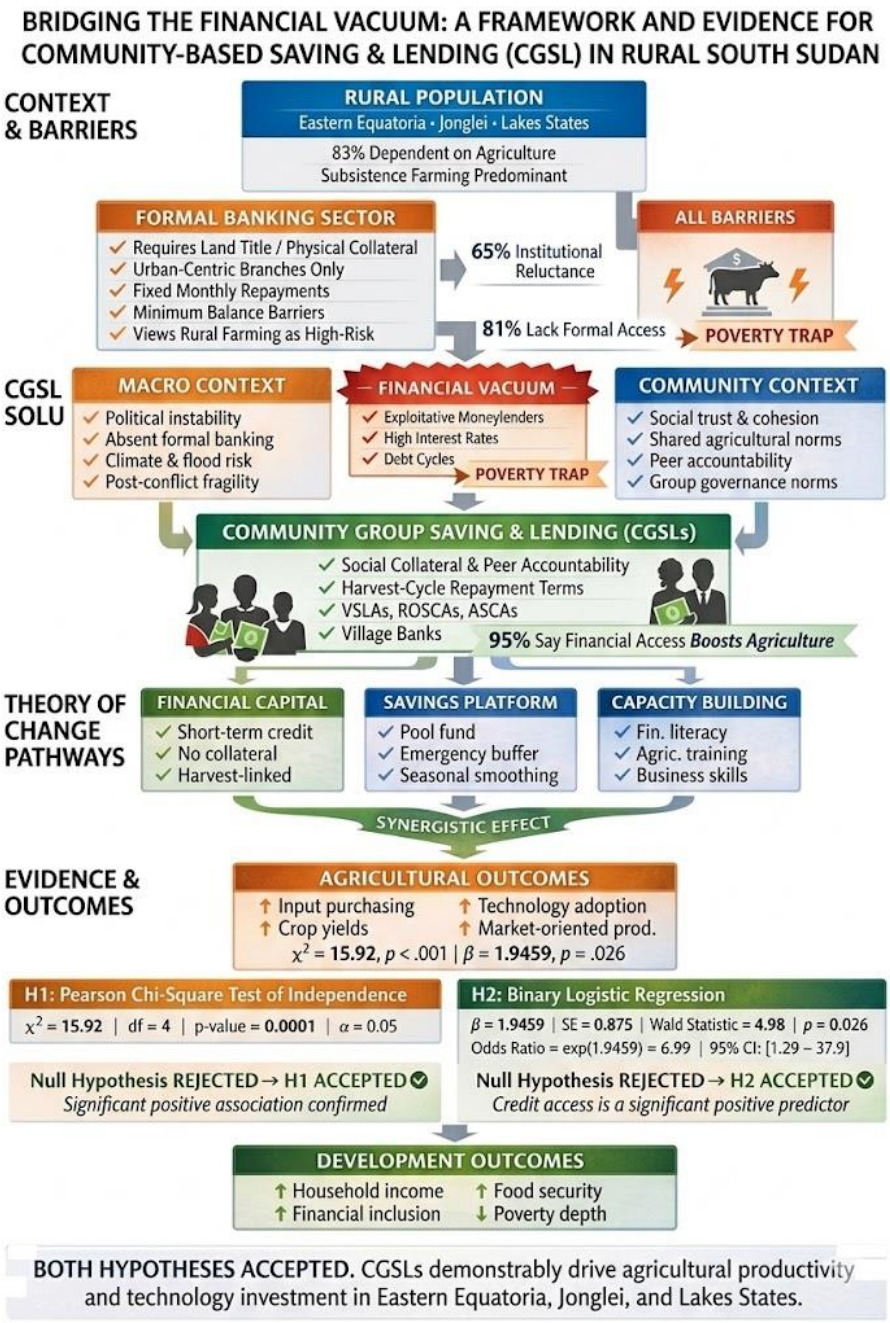

Figure 3: The Synergistic Lending-Productivity Model (SLPM) — Author-Developed Conceptual Framework

Note: *The Synergistic Lending-Productivity Model (SLPM), illustrating how macro context, community context, and three CGSL output pathways interact to produce agricultural and development outcomes. Source: Authors (Toch & Riak, 2025).*

The statistical signature of this synergistic process is captured by the two hypothesis tests. The chi-square result ($\chi^2 = 15.92$, $p = 0.0001$) establishes the aggregate association between CGSL membership and productivity improvement, while the logistic regression coefficient ($\beta = 1.9459$, $p = 0.026$; OR = 6.99) isolates the specific contribution of credit access to technology investment decisions (Banerjee et al., 2019; Kyeyune & Ntayi, 2025). Together, these results constitute robust quantitative evidence

for the SLPM's core proposition. The finding that 97% of respondents directly linked productivity increases to investment, and 95% linked financial access to agricultural transformation, establishes the perceived causal chain — lending → investment → productivity — as a near-universal belief among the study population (Morduch, 2019; Phil-Ugochukwu, 2024).

5.3 The Capital Ceiling: CGSLs' Critical Structural Limitation

Despite the evident strengths of CGSLs, this study identifies a critical structural limitation — the capital ceiling — that constrains the developmental trajectory of informal lending mechanisms. The high uncertainty (32%) surrounding long-term investments in land, machinery, and infrastructure, combined with the comparatively low weighted mean (3.51) for that survey item, indicates that while farmers understand the value of large-scale agricultural investment, they perceive no viable financing mechanism for it (De Haan, 2021; Rivera et al., 2020). Because CGSL loan funds are derived from members' pooled savings, the maximum available capital is structurally bounded by the group's cumulative savings capacity — typically sufficient for seeds and fertiliser, but insufficient for tractors, irrigation systems, or storage facilities (Armia, 2025; Kumar, 2020; Ksoll et al., 2016).

This limitation is not unique to South Sudan. Tsegaye and Kassahun documented an analogous capital ceiling in Ethiopia; Mugabe (2021) identified the same constraint in Rwanda. The cross-contextual consistency of this finding strengthens the policy case for developing tiered financial products that build on CGSL foundations while providing pathways to larger, longer-term capital — the 'missing middle' of rural finance (Morduch, 2019; World Bank, 2003; Odhiambo, 2020).

6. CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Summary of Principal Findings

This study has generated original empirical evidence confirming that informal lending mechanisms — specifically CGSLs — are the primary driver of agrarian sustenance and incremental agricultural development in South Sudan's Eastern Equatoria, Jonglei, and Lakes States. The quantitative findings ($\chi^2 = 15.92$, $p = 0.0001$; $\beta = 1.9459$, $p = 0.026$) and near-universal qualitative consensus (95% agreement on financial access potential; 100% agreement on working capital scarcity) establish a clear and statistically robust positive relationship between CGSL participation and agricultural productivity, confirming the applicability of Financial Inclusion Theory in this context (Sarma & Pais, 2011; Kyeyune & Ntayi, 2025). The study has also documented the Paradox of Institutional Reluctance — the structural withdrawal of formal institutions from the populations that most need their services — and demonstrated its profound consequences for rural agricultural development (Alam et al., 2021; Eliste et al., 2022; FAO, 2021). The SLPM provides a novel conceptual framework for the mechanisms

through which informal lending generates synergistic developmental outcomes across financial, human, and social capital pathways (Ellis & Adams, 2020; Nimieri, 2024).

6.2 Policy Recommendations

Recommendation 1 — Wholesale Lending to CGSLs: The most consequential intervention available to the Bank of South Sudan and international development finance institutions is the establishment of a tiered wholesale lending facility — channelling capital to established, high-performing CGSLs rather than to individual borrowers. This would leverage existing CGSL trust infrastructure while providing capital volumes beyond internal savings capacity (World Bank, 2003; Phil-Ugochukwu, 2024). Similar models have demonstrated success in Kenya and Uganda (Mutua et al., 2019; Mugisha & Okello, 2020).

Recommendation 2 — Harvest-Linked Loan Product Design: Development finance partners should support MFIs in developing standardised harvest-linked loan products explicitly modelled on the repayment flexibility already embedded in CGSL practice (Tenaw & Islam, 2009). This would begin to bridge the gap between formal and informal lending without requiring formal institutions to absorb the full risk of rural agricultural portfolios (Odhiambo, 2020; Kifle & Olonisakin, 2023).

Recommendation 3 — Integrated Financial Literacy Programming: All CGSL support programmes must incorporate structured financial literacy modules as a non-negotiable component. The educational variation across the three study states, and its correlation with levels of financial uncertainty in the survey data, indicates that targeted literacy investment will yield significant returns in loan utilisation quality and investment decision-making (Davis et al., 2021; Bhanu, 2023; Ater et al., 2021).

Recommendation 4 — Digital Financial Integration: Development partners should invest in piloting mobile money integrations with established CGSLs, which would enhance transaction transparency, reduce internal mismanagement risk, and begin building the digital financial identity of members — a prerequisite for their eventual integration into formal financial systems (Muasa & Matsuda, 2019; Arinze, 2024).

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