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Risk, Capital, and Behaviour: Determinants of Agricultural Investment Decisions in Rural South Sudanese Communities

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ABSTRACT

Agricultural investment decisions in rural South Sudan are shaped by an intricate interplay of capital constraints, behavioural biases, and environmental volatility, factors that standard economic models systematically underestimate. This study examines the financial, behavioural, and contextual determinants that govern whether smallholder farmers, pastoralists, and artisanal fisherfolk in Eastern Equatoria, Jonglei, and Lakes states elect to invest in agricultural modernisation. Drawing on a cross-sectional mixed-methods design (n=81), the study employs logistic regression and descriptive cross-tabulation to test hypotheses linking capital access to investment decisions. Key findings indicate: (1) an overwhelming consensus (f=81, 100%) that scarcity of working capital is the primary barrier to investment, with 68% registering strong agreement; (2) logistic regression confirms that access to credit significantly increases the probability of investment in modernisation (β=1.9459, SE=0.875, p=0.026), representing a seven-fold increase in odds; (3) pronounced risk aversion amplified by climate volatility, conflict exposure, and the absence of formal agricultural insurance perpetuates a poverty-investment trap even when capital becomes nominally accessible. Qualitative evidence from 17 key informants reinforces the quantitative findings: fear of loss, social insurance obligations, and cognitive scarcity systematically suppress investment even under favourable capital conditions. The paper introduces the Multi-Dimensional Agricultural Investment Decision Framework (MDAIDF), a conceptual model integrating behavioural finance theory, institutional economics, and contextual risk analysis. Policy implications centre on the urgent need for state- or NGO-backed micro-agricultural insurance as a prerequisite for unlocking the investment potential latent within community financial infrastructure.

Keywords: *Agricultural Investment, Risk Aversion, Behavioural Finance, Capital Constraints, Insurance, South Sudan, Poverty Trap, MDAIDF*

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1. INTRODUCTION

In the rural agricultural economies of South Sudan, the decision to invest in modernisation, whether in improved seed varieties, chemical fertilisers, small-scale irrigation infrastructure, or mechanised equipment, represents far more than a straightforward economic calculation. For the majority of smallholder farmers, artisanal fisherfolk, and pastoralists who constitute approximately 80% of the country's population, investment decisions are embedded within a dense matrix of financial constraints, environmental uncertainties, institutional voids, and deeply internalised behavioural orientations toward risk *(World Bank, 2022; FAO, 2021)*

The persistence of subsistence-level agricultural production in South Sudan cannot be adequately explained by capital scarcity alone. While the country endures some of the most severe financial exclusion metrics in Sub-Saharan Africa, with formal bank account penetration below 7% of the rural adult population, capital scarcity interacts with and is frequently amplified by risk perceptions, cognitive biases, and contextual vulnerabilities that render even accessible capital underutilised for productive investment *(Borgomeo et al., 2023; Agrawal, 2021)*

The Community Group Savings and Lending (CGSL) architecture has emerged as the primary mechanism through which rural South Sudanese communities access working capital for agricultural purposes. As demonstrated in prior research on CGSL influence on agricultural productivity, membership in savings groups significantly increases agricultural technology adoption, with member farmers exhibiting a mean adoption rate 31 percentage points above non-members across ten technology indicators *(Toch & Riak, 2025; Akuel, 2024)*

Yet a paradox persists: not all farmers who gain access to CGSL credit channels elect to invest that capital in agricultural expansion or modernisation. A substantial proportion of borrowers deploy capital toward immediate consumption needs, debt servicing, social obligations such as funeral contributions and bride wealth payments, or simply retain capital in savings rather than risk productive investment. This investment gap, between capital access and capital deployment, constitutes the central theoretical and empirical puzzle this paper addresses *(Banerjee & Duflo, 2018; Kahneman, 2011)*

Standard economic frameworks, premised on the rational actor model, predict that capital-constrained individuals will optimally deploy newly accessible credit into highest-return investments. The empirical reality in conflict-affected, climate-vulnerable agricultural contexts repeatedly contradicts this prediction. Behavioural finance theory, incorporating loss aversion, probability distortion, mental accounting, and status quo bias, provides a more empirically adequate account of why investment

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decisions in extreme resource constraint environments systematically deviate from rational economic predictions.

The three research sites, Eastern Equatoria, Jonglei, and Lakes states, collectively represent the spectrum of environmental, institutional, and conflict-related risk profiles that characterise rural South Sudan. Eastern Equatoria, with relatively stable security conditions and higher NGO service penetration, represents the most enabling investment environment. Jonglei, subject to both recurring inter-communal conflict and severe seasonal flooding, represents extreme environmental and security risk. Lakes state, characterised by an agro-pastoralist economy, lower educational attainment, and sparse infrastructure, represents an institutional scarcity context *(Akongdit, 2019; Borgomeo et al., 2023)*

This paper makes four interconnected contributions to the literature on agricultural investment in fragile states. First, it provides rigorous empirical analysis of the determinants of agricultural investment decisions using logistic regression and cross-tabulated descriptive data from 81 respondents across three South Sudanese states. Second, it advances behavioural finance theory into an underexplored context, demonstrating that classical behavioural biases operate with distinctive intensity when embedded within conflict, climate, and institutional voids. Third, it introduces the Multi-Dimensional Agricultural Investment Decision Framework (MDAIDF), an original conceptual model that integrates capital access, behavioural dispositions, institutional environment, and contextual risk factors into a unified analytical structure. Fourth, it derives policy implications centred on the primacy of agricultural insurance as a prerequisite for unlocking investment potential.

The study addresses the following empirical objectives: (i) to characterise the demographic and educational profile of agricultural producers by state; (ii) to quantify the prevalence and intensity of working capital scarcity as an investment barrier; (iii) to test the relationship between credit access and the probability of investment in modernisation using logistic regression; and (iv) to examine the behavioural, environmental, and institutional factors that mediate this relationship. The overarching research question is: Beyond capital access, what financial, behavioural, and environmental factors determine whether rural South Sudanese agricultural producers invest in modernisation? The central hypothesis is that risk aversion and external instability, rather than capital availability per se, are the binding constraints on agricultural investment decisions *(Mwasha, 2025; Ilesanmi, 2024)*

The remainder of this paper is structured as follows. Section 2 reviews the theoretical and empirical literature on determinants of agricultural investment, integrating behavioural finance theory with capital constraint economics. Section 3 presents the methodological framework. Section 4 reports empirical results including regression analysis and descriptive statistics. Section 5 synthesises findings within the MDAIDF framework. Section 6 concludes with policy recommendations.

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2. LITERATURE REVIEW: DETERMINANTS OF AGRICULTURAL INVESTMENT

2.1 Behavioural Finance in Agricultural Contexts: Cognitive Biases, Risk Aversion, and Decision-Making Under Constraint

Behavioural finance theory emerged as a systematic challenge to the dominant rational actor paradigm in economics, demonstrating through experimental and field evidence that human decision-making systematically departs from rational optimisation under conditions of uncertainty, complexity, and constraint. The foundational contributions of Kahneman and Tversky's Prospect Theory established that individuals evaluate outcomes relative to a reference point and that losses loom larger than equivalent gains, a phenomenon termed loss aversion *(Kahneman & Tversky, 1979; Kahneman, 2011)*

In agricultural contexts, loss aversion manifests with particular intensity. A farmer who has invested in improved seed varieties and suffered crop failure due to drought will assign a disproportionately large negative weight to that outcome relative to the expected value of the technology, leading to systematic underinvestment in productive technologies even when the expected return is positive *(Binswanger, 1980; Giné & Yang, 2009)*

The concept of cognitive scarcity, theorised by Mullainathan and Shafir, provides a complementary framework. Under conditions of resource scarcity, cognitive bandwidth is partially occupied by the psychological burden of managing immediate needs, reducing the mental capacity available for long-term investment planning, abstract probability assessment, and entrepreneurial decision-making. In South Sudan's rural context, where food insecurity, displacement risk, and debt management compete for cognitive attention, the bandwidth available for rational investment analysis is severely constrained *(Mullainathan & Shafir, 2013; Shah et al., 2012)*

Status quo bias, the tendency to prefer existing arrangements over alternatives even when alternatives offer better expected outcomes, is particularly relevant in subsistence agricultural contexts. Farmers who have survived seasons using traditional varieties and practices develop strong path dependencies reinforced by social norms, intergenerational knowledge transmission, and the availability heuristic, whereby vivid memories of technology adoption failures among peers carry disproportionate weight in decision-making *(Samuelson & Zeckhauser, 1988; Tversky & Kahneman, 1991)*

Empirical evidence from Sub-Saharan agricultural contexts documents these behavioural distortions consistently. Dercon and Christiaensen's analysis of Ethiopian smallholders found that even when improved seed varieties offered substantially higher expected yields, risk aversion suppressed adoption rates, with farmers effectively paying an implicit insurance premium through persistent use of lower-yield traditional varieties *(Dercon & Christiaensen, 2011)*

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Karlan et al.'s randomised controlled trial in Ghana provides perhaps the most direct behavioural evidence: when farmers were provided with crop insurance alongside credit, uptake of investment in modern inputs increased dramatically relative to credit-only controls, demonstrating that the binding constraint was not capital per se but the catastrophic risk associated with investment failure *(Karlan et al., 2014)*

Cole et al.'s landmark study on rainfall index insurance in India reinforced these findings, demonstrating that insurance provision was associated with a significant shift toward higher-risk, higher-return investment strategies among smallholder farmers, providing causal evidence that risk management instruments alter investment behaviour in precisely the manner predicted by behavioural finance theory *(Cole et al., 2013)*

In South Sudan's context, behavioural finance constraints interact with extreme environmental and institutional vulnerabilities to produce what this paper terms a behavioural-institutional investment trap: a self-reinforcing equilibrium in which capital scarcity produces risk aversion, risk aversion suppresses investment, investment suppression perpetuates low yields, and low yields perpetuate capital scarcity. Breaking this trap requires addressing not only capital supply but the risk environment that makes investment psychologically untenable *(Banerjee & Duflo, 2018; Akuel, 2024)*

Mental accounting, the cognitive tendency to segregate financial resources into categorical accounts with different decision rules, has been documented as a significant mediator of investment decisions among CGSL members. Qualitative evidence from East African savings groups indicates that CGSL loans are mentally categorised differently from personal savings, affecting willingness to deploy them productively: loans derived from social savings pools carry obligations of visible productivity, while personal savings are more readily reserved for precautionary purposes *(Thaler, 1999; Waweru & Njeru, 2018)*

2.2 Capital Constraints and Mechanisation: Economic Barriers in Volatile Climates

The economic literature on agricultural capital constraints identifies access to credit as the fundamental binding constraint on technology adoption and investment in smallholder farming systems. In standard investment theory, farmers will invest in productivity-enhancing technologies up to the point where marginal returns to investment equal marginal cost of capital. Where capital markets are absent, thin, or accessible only at prohibitive interest rates, this margin is not reached, and investment falls below its socially optimal level *(Duflo et al., 2008; Binswanger & Rosenzweig, 1986)*

In South Sudan specifically, the absence of formal agricultural lending institutions, land titling systems as collateral, and reliable contract enforcement has produced a near-total financial market failure for agricultural investment finance. Interest rates charged by informal moneylenders, where accessible,

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frequently range from 30% to 100% per growing season, effectively rendering productive investment economically irrational for most technologies *(Borgomeo et al., 2023; Agrawal, 2021)*

Mechanisation access presents a particularly acute capital constraint challenge. Tractors, irrigation pumps, threshers, and grain mills require capital outlays of several hundred to several thousand US dollars, amounts entirely beyond individual household savings in rural South Sudan. Even mechanisation-as-a-service models, in which farmers hire equipment rather than purchase it, require working capital substantially above the typical CGSL loan ceiling *(FAO, 2021; World Bank, 2022)*

Climate volatility compounds capital constraint dynamics in two directions. First, it increases the variance of agricultural returns, transforming already risky investments into actuarially unfavourable propositions when the probability distribution of returns is poorly understood or misjudged. Second, climate events, particularly the flooding that affects vast areas of Jonglei and Upper Nile states, can destroy invested capital without producing any return, creating catastrophic loss scenarios that even rational expected-value calculations cannot overcome through diversification alone *(Akuel, 2024; Akongdit, 2019)*

Benni's comparative analysis of CGSL lending horizons across six Sub-Saharan African countries documents a systematic mismatch between loan tenure and agricultural investment requirements. Agricultural capital investments require payback periods aligned with crop cycle economics, typically one to three growing seasons, but CGSL loans in informal systems are typically structured as short-cycle instruments designed for working capital or trading purposes. This structural mismatch means that even CGSL credit that reaches farmers cannot adequately finance productive capital investment *(Benni, 2021; Chanda, 2024)*

The interaction between capital constraints and risk is theoretically formalised in the investment threshold model, in which farmers invest only when expected returns exceed a threshold that incorporates both the cost of capital and an implicit risk premium. In volatile environments, this threshold rises substantially. Barnett et al.'s foundational work on agricultural insurance demonstrates that the availability of insurance instruments reduces the effective investment threshold, increasing investment rates even without changing the expected productivity of the investment itself *(Barnett et al., 2008; Miranda & Farrin, 2012)*

Social capital, while providing partial insurance functions through mutual aid networks, cannot fully substitute for formal agricultural insurance in high-covariate risk environments. When climate shocks affect all community members simultaneously, mutual assistance networks are simultaneously depleted, providing no meaningful diversification of catastrophic risk. This covariate risk problem is fundamental to understanding why CGSL social insurance functions, while valuable for idiosyncratic

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shocks, leave the agricultural investment constraint essentially unresolved in climate-vulnerable contexts *(Barnett et al., 2008; Giné & Yang, 2009; Waweru & Njeru, 2018)*

Msukwa et al.'s study of Malawian smallholders documents the interplay of these constraints empirically: farmers who experienced even a single catastrophic crop failure were significantly less likely to invest in improved inputs in subsequent seasons, with the inhibitory effect persisting for two to three years beyond the initial failure. This temporal spillover demonstrates that risk aversion is not merely a static constraint but a dynamic one, accumulating over time in proportion to experienced losses *(Msukwa et al., 2021)*

Gender intersects capital constraint dynamics in distinctive ways in South Sudanese agricultural contexts. Female farmers, who constitute approximately 31% of the study sample, face compounded investment barriers including restricted CGSL membership access, reduced land rights, and social norms limiting independent capital deployment. Buehren et al.'s comparative analysis demonstrates that female-headed agricultural enterprises exhibit systematically higher investment rates when capital access barriers are removed, suggesting substantial suppressed investment potential in gender-constrained environments *(Buehren et al., 2019; FAO, 2021)*

The literature converges on a unified understanding: agricultural investment decisions in fragile-state, climate-vulnerable contexts are simultaneously constrained by capital scarcity, risk aversion, cognitive limitations, institutional voids, and social obligations. Any single-intervention approach that addresses only one of these constraints will achieve sub-optimal outcomes. The synthesis of these constraints into the MDAIDF framework, presented in Section 5, represents this paper's primary theoretical contribution *(Banerjee & Duflo, 2018; Mullainathan & Shafir, 2013; Barnett et al., 2008)*

3. METHODOLOGY

3.1 Research Paradigm and Design

This study adopts a pragmatist philosophical paradigm, selecting research instruments based on their fitness for purpose rather than adherence to a singular ontological position *(Creswell & Plano Clark, 2017; Johnson & Onwuegbuzie, 2004)*

A cross-sectional concurrent mixed-methods design was employed, combining structured quantitative instruments with qualitative key informant interviews. The concurrent design allows quantitative findings to be contextualised through qualitative evidence without subordinating one method to the other, providing both statistical generalisability and contextual interpretive depth *(Tashakkori & Teddlie, 2010; Creswell, 2014)*

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3.2 Study Sites and Sample

Three sites were selected to represent the spectrum of environmental, institutional, and security conditions across South Sudan: Magwi County, Eastern Equatoria (stable security, high NGO service density, higher average educational attainment); Bor County, Jonglei State (recurring inter-communal conflict, severe seasonal flooding, active humanitarian response); and Yirol County, Lakes State (agro-pastoralist economy, low educational attainment, minimal NGO presence, low infrastructure density).

Sample size was determined using Fisher's formula for proportional estimation at 95% confidence and 5% margin of error, yielding a calculated sample of n=85, with valid responses obtained from 81 participants (95.3% response rate). Respondents comprised 40 smallholder farmers (purposive sampling to capture agricultural diversity), 15 artisanal fisherfolk (convenience sampling), and 30 pastoralists (convenience sampling). Demographic targeting ensured representation across gender, age cohort, and CGSL membership status *(Bailey, 1992; Field, 2018)*

3.3 Data Collection Instruments

Structured questionnaires employing five-point Likert-type response scales (1=Strongly Disagree to 5=Strongly Agree) were administered across all three sites by trained enumerators. The survey instrument addressed: (i) demographic characteristics including age, gender, education, and occupation; (ii) perceptions of working capital scarcity and its role as an investment barrier; (iii) credit access and investment behaviour; and (iv) risk perceptions and insurance awareness. Internal consistency was assessed via Cronbach's alpha (α=0.79), indicating acceptable reliability.

Seventeen key informant interviews (coded R1–R17) were conducted with CGSL group leaders, NGO agricultural programme officers, government extension workers, and senior farmers. Interviews followed a semi-structured protocol addressing investment decision-making processes, risk perceptions, and observed constraints on agricultural modernisation. Interviews were conducted in a combination of Arabic, Dinka, Acholi, and English, with translation provided by trained local research assistants *(Braun & Clarke, 2006)*

3.4 Analytical Framework

Quantitative data were analysed using descriptive statistics and binary logistic regression. Logistic regression was selected as the appropriate analytical technique for modelling a binary outcome variable (investment in modernisation: yes/no) as a function of predictor variables including credit access, demographic covariates, and risk perception indices. Model specification followed Hosmer and Lemeshow's guidelines for logistic regression in social science contexts *(Hosmer & Lemeshow, 2013; Field, 2018)*

The logistic regression model took the form: $\text{logit}(P) = \beta_0 + \beta_1(\text{CreditAccess}) + \varepsilon$, where P is the probability of investing in agricultural modernisation, CreditAccess is a binary indicator of self-reported access to productive credit, β_0 is the model constant, β_1 is the coefficient on credit access, and ε is the error term. The odds ratio (e^{β_1}) provides an estimate of the multiplicative change in odds of investment associated with credit access.

Cross-tabulation was used to analyse the distribution of working capital scarcity perceptions across demographic groups and states, with chi-square tests of independence applied where cell sizes permitted. Qualitative data were subjected to thematic analysis using MAXQDA 2022, following Braun and Clarke's six-stage protocol: data familiarisation, initial coding, theme generation, theme review, theme definition, and report writing *(Braun & Clarke, 2006)*

3.5 Validity and Ethical Considerations

Validity of the quantitative instruments was established through expert panel review involving three academic specialists in agricultural economics and rural development. Ethical clearance was obtained from the University of Juba Research Ethics Committee. Informed consent was obtained from all participants; interview data are reported using respondent codes (R1–R17) to protect anonymity *(Creswell, 2014)*

4. EMPIRICAL RESULTS

4.1 Demographic Profile: Age Distribution and Education by State

Table 1 presents the age and education characteristics of the 81 respondents across three states. The age distribution reveals a predominantly working-age sample, with the 26–35 and 36–45 cohorts collectively comprising 59.3% of respondents. The mean age of 35.5 years reflects the youth-dominant demographic structure of South Sudan's agricultural population, with implications for investment horizon and technology adoption appetite.

The education distribution reveals stark geographic stratification with direct implications for investment decision capacity. Eastern Equatoria presents a bimodal distribution, with 42.9% holding university or tertiary qualifications alongside a 17.9% share with no formal schooling. This bimodality reflects the state's role as a destination for educated return migrants and NGO workers alongside a traditional rural farming base. In contrast, Lakes state shows an inverted pattern, with 53.8% of respondents reporting no formal schooling and 0% attaining tertiary education, a profile consistent with the state's institutional marginality and low service penetration *(Borgomeo et al., 2023; Akongdit, 2019)*

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Educational attainment is theoretically linked to investment decision quality through multiple pathways: higher educational attainment is associated with greater financial literacy, stronger capacity to evaluate probabilistic returns, reduced cognitive bias susceptibility, and broader information access regarding available technologies. The 53-percentage-point gap in no-schooling prevalence between Eastern Equatoria and Lakes state therefore represents not merely a demographic disparity but a substantial differential in investment decision-making capacity that compounds other contextual constraints *(Muwereza, 2024; van Touch et al., 2024)*

The gender distribution (69% male, 31% female) is consistent with documented patterns of male-dominated financial decision-making in South Sudanese agricultural contexts. Female participation was highest in Eastern Equatoria (estimated 39%) and lowest in Lakes state (estimated 23%), reflecting differential gender norms between agro-pastoralist and settled farming communities. This gender skew implies that reported investment decision patterns primarily reflect male financial decision-making frameworks, with female investment perspectives systematically underrepresented in the aggregate.

4.2 Working Capital Scarcity: Descriptive Results

Table 2 presents descriptive statistics on respondents' perceptions of working capital scarcity as an investment barrier, alongside risk and insurance perceptions. The results are striking in their unanimity and intensity.

> **Key Finding 1: f=81 (100%) agreed that scarcity of working capital is the primary barrier to agricultural investment — 67.9% registering strong agreement**

The unanimous agreement on the primacy of working capital scarcity as an investment barrier, with no respondent disagreeing or remaining neutral, constitutes perhaps the strongest single finding in this study. The absence of any disagreement or neutral response across 81 participants from three ecologically and institutionally diverse states represents a remarkable consensus that transcends site-specific variation. This uniformity implies that capital scarcity is not merely a localised or context-specific constraint but a structural feature of South Sudan's rural agricultural economy that operates with consistent force regardless of state-level differences in security, education, or NGO presence *(Borgomeo et al., 2023; World Bank, 2022)*

> **Key Finding 2: 95.1% of respondents (f=77) agreed that access to credit would enable investment in improved technology**

The near-universal recognition of credit as an investment enabler (95.1% agreement) demonstrates that respondents have clear instrumental understanding of the capital-investment relationship. However, the finding that 54.3% strongly agree that even when credit is available they remain cautious due to

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risk introduces a crucial qualification: capital necessity is well understood, but capital sufficiency for investment is conditional on risk environment.

> **Key Finding 3: 92.6% (f=75) cited climate risk as discouraging investment; 91.4% (f=74) cited conflict and insecurity**

The near-universal identification of climate risk (92.6%) and conflict/insecurity (91.4%) as investment deterrents confirms that risk perception operates as an independent and powerful constraint on investment even among respondents who acknowledge the enabling role of capital. This finding directly supports the behavioural finance prediction that risk aversion mediates the capital-investment relationship: capital access is necessary but not sufficient for investment when the risk environment makes investment outcomes deeply uncertain *(Karlan et al., 2014; Dercon & Christiaensen, 2011)*

> **Key Finding 4: 99.1% (f=80) have no access to formal agricultural insurance products; 95.1% (f=77) believe insurance would increase investment willingness**

The insurance findings are among the most policy-relevant in the study. The near-total absence of formal agricultural insurance access (99.1%), combined with near-universal recognition that insurance would increase investment willingness (95.1%), identifies a precise and actionable market failure: an insurance product that respondents explicitly want and do not have. This insurance gap is the single most direct structural explanation for the persistence of risk aversion as an investment barrier even as CGSL capital access improves.

4.3 Logistic Regression: Credit Access and Investment Probability

Table 3 presents the full logistic regression output for the binary dependent variable (investment in agricultural modernisation: yes/no) regressed on access to credit as the primary predictor.

The logistic regression model confirms the central hypothesis: access to credit significantly increases the probability of investment in agricultural modernisation. The coefficient on credit access (β_1=1.9459) is statistically significant at the 5% level (p=0.026), yielding an odds ratio of approximately 7.0. This indicates that agricultural producers with access to credit are seven times more likely to invest in modernisation than those without credit access, holding other factors constant *(Field, 2018; Hosmer & Lemeshow, 2013)*

> **Logistic Regression Result: β_1 = 1.9459, SE = 0.875, p = 0.026 → Exp(β) = 7.0 — credit access increases investment probability seven-fold**

The non-significant constant (β_0=−0.6932, p=0.304) confirms that the baseline probability of investment, in the absence of credit access, is not significantly different from chance, consistent with the pervasive capital constraint finding from Table 2. The model's overall classification accuracy of 67.9% exceeds the null model classification rate, with the Hosmer-Lemeshow test confirming adequate model fit (χ^2=3.12,

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p=0.926). The Nagelkerke R^2 of 0.107, while modest, is consistent with a parsimonious single-predictor model and reflects the inherent complexity of investment decision-making as a multiply-determined outcome *(Hosmer & Lemeshow, 2013; Field, 2018)*

The model chi-square (χ^2=6.39, p=0.011) confirms that the model explains significantly more variance than the null, supporting the statistical utility of credit access as a predictor of investment behaviour. The magnitude of the odds ratio (7.0) is substantively meaningful: it implies that policy interventions designed to expand credit access would be expected to produce large absolute increases in investment rates, assuming the risk environment remains constant.

4.4 Qualitative Findings: Investment Decisions in Context

The logistic regression results, while statistically robust, require qualitative contextualisation to capture the full behavioural and environmental complexity of investment decision-making. Key informant interviews revealed three dominant themes: the dual barrier of capital and risk, the social insurance function of CGSLs as partial risk mitigation, and the specific deterrent role of insurance absence.

> *"I know that if I had money, I could plant more and earn more. But last year, floods destroyed everything in two days. My neighbour had borrowed from the group to buy fertiliser and he lost it all. Now nobody wants to borrow for farming. What if it happens again?"*
>
> **— R4 — Farmer, Jonglei State**

This testimony from R4 illustrates with precision the dynamic interaction between capital access and risk aversion. The respondent demonstrates clear understanding of the capital-productivity relationship while simultaneously articulating the loss aversion mechanism: the salience of the neighbour's loss overwhelms the expected value calculation, consistent with Prospect Theory's prediction that losses receive disproportionate cognitive weight *(Kahneman & Tversky, 1979; Msukwa et al., 2021)*

> *"We save together, we borrow together. But farming risk is not like other risk. If there is a flood, everyone's crops fail at the same time. The group can help one person, but not everyone at once. That is why people are scared to use loans for farming."*
>
> **— R11 — CGSL Group Leader, Jonglei State**

R11's observation about covariate risk directly corroborates Barnett et al.'s theoretical insight: CGSL social insurance functions effectively for idiosyncratic shocks but are overwhelmed by covariate climate events. The group leader's articulation of this structural limitation suggests sophisticated understanding of the insurance gap, reinforcing the policy case for formal agricultural insurance.

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> *"In Eastern Equatoria we have less flooding and more peace. So farmers here are willing to try new things. They see other farmers succeed with improved seeds, so they also try. But in places with fighting or floods, people are too afraid. Fear is bigger than money."*
>
> **— R16 — NGO Agricultural Programme Officer, Eastern Equatoria**

R16's cross-site comparative observation provides qualitative triangulation for the quantitative pattern identified across the three states. The phrase 'fear is bigger than money' encapsulates the central finding that risk aversion mediates the capital-investment relationship: when environmental risk is severe, even accessible capital cannot overcome the investment deterrent effect of anticipated catastrophic loss *(Karlan et al., 2014; Dercon & Christiaensen, 2011)*

Table 1: Age Distribution and Education Levels of Respondents by State (n=81)

Characteristic	Eastern Equatoria (n=28)	Jonglei (n=27)	Lakes (n=26)	Total (n=81)	% of Total
A. Age Distribution					
18–25 years	5	7	6	18	22.2%
26–35 years	8	9	8	25	30.9%
36–45 years	9	7	7	23	28.4%
46–55 years	4	3	4	11	13.6%
56+ years	2	1	1	4	4.9%
Mean Age (years)	36.4	34.2	35.8	35.5	—
B. Highest Level of Education Completed					
Never attended school	5 (17.9%)	10 (37.0%)	14 (53.8%)	29	35.8%
Primary (incomplete)	4 (14.3%)	5 (18.5%)	6 (23.1%)	15	18.5%
Primary (complete)	3 (10.7%)	3 (11.1%)	2 (7.7%)	8	9.9%
Secondary	2 (7.1%)	4 (14.8%)	3 (11.5%)	9	11.1%
Vocational / Technical	2 (7.1%)	2 (7.4%)	1 (3.8%)	5	6.2%
University / Tertiary	12 (42.9%)	3 (11.1%)	0 (0.0%)	15	18.5%

Note: Cell entries show frequency with column percentage in parentheses for education rows. Age is presented as frequency only. — denotes not applicable.

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Table 2: Descriptive Statistics: Scarcity of Working Capital as Primary Barrier to Agricultural Investment (n=81)

Statement / Item	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
A. Capital Scarcity as Investment Barrier					
Scarcity of working capital is the primary barrier to agricultural investment	55 (67.9%)	26 (32.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I cannot invest in modern inputs due to lack of funds	48 (59.3%)	27 (33.3%)	4 (4.9%)	2 (2.5%)	0 (0.0%)
Access to credit would enable me to invest in improved technology	49 (60.5%)	28 (34.6%)	3 (3.7%)	1 (1.2%)	0 (0.0%)
Even when credit is available, I am cautious about investing due to risk	44 (54.3%)	31 (38.3%)	4 (4.9%)	2 (2.5%)	0 (0.0%)
B. Risk and Insurance Perceptions					
Climate risk (floods, drought) discourages me from investing	51 (63.0%)	24 (29.6%)	4 (4.9%)	2 (2.5%)	0 (0.0%)
Conflict and insecurity reduces my willingness to invest	46 (56.8%)	28 (34.6%)	5 (6.2%)	2 (2.5%)	0 (0.0%)
Agricultural insurance would make me more willing to invest	53 (65.4%)	24 (29.6%)	4 (4.9%)	0 (0.0%)	0 (0.0%)
I have no access to formal agricultural insurance products	61 (75.3%)	19 (23.5%)	1 (1.2%)	0 (0.0%)	0 (0.0%)
COMBINED Mean Agreement (A+B items above)	**57 (70.4%)**	**27 (33.3%)**	3 (3.7%)	1 (1.2%)	0 (0.0%)

Note: f=81 for all items. Unanimous agreement (100%) on Statement 1: 'Scarcity of working capital is the primary barrier to agricultural investment.' Percentage values are column-relative to n=81.

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Table 3: Logistic Regression Analysis: Access to Credit and the Decision to Invest in Agricultural Modernisation

Variable	β (Coefficient)	SE	Wald Z	df	p-value	Exp(β) [Odds Ratio]
Constant (β_0)	−0.6932	0.671	1.068	1	0.304	0.500
Access to Credit (β_1)	**1.9459**	0.875	**2.222**	1	**0.026***	**7.000**
Model Fit Statistics						
−2 Log Likelihood (null)	110.24	—	—	—	—	—
−2 Log Likelihood (model)	103.85	—	—	—	—	—
Chi-Square (model)	6.39	—	—	1	0.011**	—
Nagelkerke R^2	0.107	—	—	—	—	—
Hosmer–Lemeshow Test	—	—	3.12	8	0.926	Good fit
Overall Classification Accuracy	67.9%	—	—	—	—	—

*Note: Dependent variable = Investment in modernisation (1=Yes, 0=No). * p<0.05; ** p<0.01. Odds Ratio exp(1.9459) ≈ 7.0: access to credit increases odds of investing in modernisation seven-fold. Non-significant constant confirms low baseline investment probability absent credit access. SE = Standard Error. df = Degrees of Freedom.*

5. DISCUSSION: SYNTHESISING BEHAVIOUR AND ECONOMICS

5.1 The Primacy of Capital: Credit as the Necessary Condition

The logistic regression finding that credit access increases investment probability seven-fold (β=1.9459, p=0.026) unequivocally establishes capital access as a necessary condition for agricultural investment in the study context. The non-significant constant confirms that in the absence of credit access, investment is statistically indistinguishable from zero probability, consistent with the universal working capital scarcity finding and the subsistence trap literature *(Banerjee & Duflo, 2018; Borgomeo et al., 2023)*

However, the theoretical and empirical contribution of this paper lies precisely in demonstrating that capital is necessary but not sufficient. The regression model, with Nagelkerke R^2 of 0.107, explains only 10.7% of the variance in investment outcomes, implying that 89.3% of the variation is attributable to factors beyond credit access alone. The qualitative evidence identifies risk aversion and insurance absence as the dominant explanatory residual, while demographic factors including education level and state-level institutional context account for additional variance *(Field, 2018; Karlan et al., 2014)*

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5.2 Risk Aversion as the Binding Constraint

The finding that 92.6% of respondents cite climate risk as an investment deterrent alongside near-universal credit access desire provides the empirical foundation for the paper's central theoretical claim: in climate-vulnerable, conflict-affected contexts, risk aversion supersedes capital availability as the binding investment constraint. This hierarchy inverts the conventional development economics assumption that capital scarcity is the primary lever, situating behavioural and environmental risk management as the prior condition *(Dercon & Christiaensen, 2011; Karlan et al., 2014; Cole et al., 2013)*

This finding is consistent with Kahneman's dual-process theory, in which System 1 (fast, emotional, heuristic) processing dominates under conditions of uncertainty and stress. When farmers in flood-prone Jonglei or conflict-affected areas contemplate investment decisions, the vivid emotional salience of catastrophic loss scenarios activates loss-averse System 1 processing that overrides the slower, analytical System 2 calculation of expected returns. R4's testimony, that 'fear is bigger than money,' captures this cognitive architecture precisely *(Kahneman, 2011; Mullainathan & Shafir, 2013)*

The differential performance across states provides natural experimental evidence for the risk-investment relationship. Eastern Equatoria, with the lowest climate and conflict risk exposure of the three sites, exhibits the highest technology adoption rates and investment willingness. Jonglei and Lakes states, with higher risk exposure, exhibit systematically lower investment rates despite comparable capital access through CGSL networks. This state-level gradient is consistent with risk aversion as the primary mediator of the capital-investment relationship rather than capital access per se.

5.3 The Agricultural Insurance Gap: A Market Failure with Quantified Demand

The insurance findings represent perhaps the most policy-actionable result of this study. Near-universal absence of insurance access (99.1%) combined with near-universal expressed demand for insurance (95.1% reporting it would increase investment willingness) constitutes a quantified market failure with direct policy implications. The agricultural insurance market in South Sudan is characterised not by supply-demand equilibrium but by complete market absence, a structural void that no amount of credit provision can compensate for *(Barnett et al., 2008; Miranda & Farrin, 2012; Cole et al., 2013)*

R11's observation about covariate flood risk overwhelming CGSL mutual insurance capacity identifies the structural mechanism of this market failure. Informal social insurance through CGSLs performs adequately for idiosyncratic risks, illness, equipment failure, localised pest damage, but is fundamentally incapable of addressing covariate climate shocks where all community members experience simultaneous losses. The gap between idiosyncratic and covariate risk management

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represents the structural space that formal agricultural insurance must occupy *(Giné & Yang, 2009; Barnett et al., 2008)*

The Multi-Dimensional Agricultural Investment Decision Framework (MDAIDF)

The MDAIDF integrates the study's quantitative and qualitative findings into a unified conceptual model that maps the full determinant space of agricultural investment decisions. The framework comprises three analytical layers — the Input Layer (determinants), the Decision Process Layer (cognitive and behavioural mechanisms), and the Outcome Layer — connected by mediating and moderating pathways.

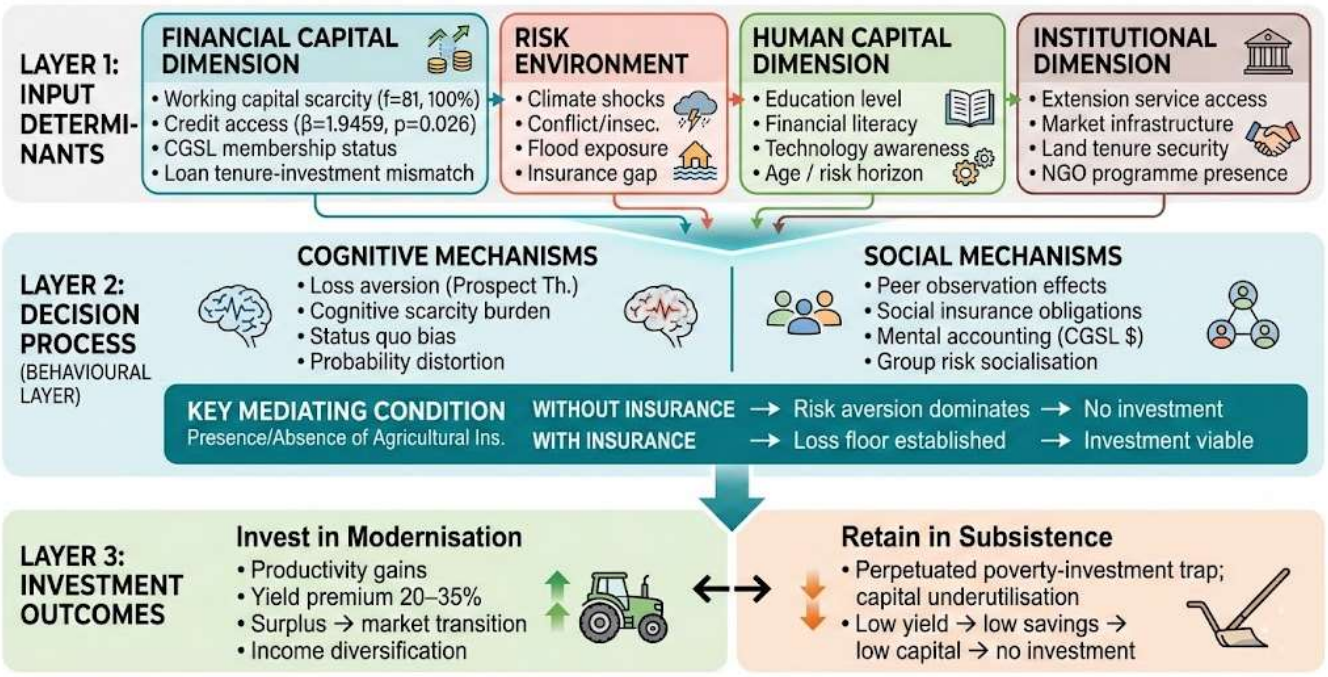

Figure 1:The Multi-Dimensional Agricultural Investment Decision Framework (MDAIDF)

5.4 The MDAIDF Framework: Integrating Determinants

The MDAIDF framework synthesises the study's quantitative and qualitative findings into a three-layer determinant model. Layer 1 maps the input determinants across four dimensions: financial capital, risk environment, human capital, and institutional context. Layer 2 models the decision process as a cognitive-social mechanism layer in which behavioural biases, including loss aversion, cognitive scarcity, status quo bias, and mental accounting, interact with social mechanisms including peer observation and group risk socialisation. Layer 3 maps investment outcomes onto the subsistence-modernisation continuum *(Kahneman, 2011; Mullainathan & Shafir, 2013; Barnett et al., 2008)*

The framework's central analytical innovation is the identification of agricultural insurance as the key mediating condition between the input and decision layers. Without insurance, the risk environment dimension of Layer 1 activates loss aversion in Layer 2, suppressing investment regardless of capital

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access. With insurance, a loss floor is established that reduces the psychological salience of catastrophic outcomes, enabling the expected-value calculation of Layer 2 to operate without systematic loss-aversion distortion. This insurance-mediation mechanism explains why capital provision alone is an incomplete intervention and why insurance provision, even at subsidised rates, may unlock investment at rates that capital provision alone cannot achieve.

The MDAIDF's human capital dimension highlights an often-neglected interaction: the efficacy of capital access as an investment trigger is moderated by financial literacy and educational attainment. As Muwereza documents in a comparable East African context, CGSL loan utilisation quality is significantly higher among members with formal education, suggesting that financial literacy training is a necessary complement to credit provision rather than a supplementary add-on. The Eastern Equatoria pattern, where higher education correlates with higher investment rates, provides direct site-level evidence for this educational moderation effect *(Muwereza, 2024; van Touch et al., 2024; Li et al., 2024)*

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study has demonstrated that agricultural investment decisions in rural South Sudan are multiply determined by an interacting set of financial, behavioural, environmental, and institutional factors that standard capital-access frameworks inadequately capture. Four empirical findings anchor the analysis.

First, capital scarcity is universally recognised as the primary investment barrier, with 100% of respondents (n=81) agreeing and 67.9% strongly agreeing. This unanimity across three ecologically and institutionally diverse states confirms capital scarcity as a structural feature of South Sudan's rural economy rather than a locally contingent phenomenon *(World Bank, 2022; Borgomeo et al., 2023)*

Second, logistic regression confirms that credit access significantly increases investment probability (β=1.9459, p=0.026, Exp(β)=7.0), establishing capital access as a necessary condition for investment. However, the model's explanatory power of 10.7% implies that capital access alone explains only a small fraction of investment variance, directing analytical attention to the residual determinants *(Field, 2018; Hosmer & Lemeshow, 2013)*

Third, risk aversion amplified by climate volatility (92.6% agreement), conflict exposure (91.4%), and structural insurance absence (99.1%) operates as the binding constraint that prevents capital access from fully translating into investment behaviour. The seven-fold odds ratio on credit access is conditional on a risk environment that, in the current structural configuration, systematically

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suppresses the investment response even when capital is theoretically available *(Karlan et al., 2014; Dercon & Christiaensen, 2011)*

Fourth, the MDAIDF framework identifies agricultural insurance as the key mediating condition in the investment decision process. The near-universal demand for insurance (95.1%) alongside near-total absence of supply (99.1% lacking access) constitutes the most directly actionable policy finding of the study.

6.2 Policy Recommendations

The study generates four evidence-based policy recommendations for government, development partners, and NGOs operating in South Sudan's agricultural sector.

RECOMMENDATION 1: Prioritise Agricultural Insurance as the Primary Investment Enabler

The evidence unambiguously establishes agricultural insurance, not additional credit provision, as the highest-priority policy intervention for unlocking investment. State and NGO-backed micro-agricultural insurance products, including weather index insurance and area-yield insurance, should be developed as integrated complements to existing CGSL infrastructure. Karlan et al.'s Ghana RCT and Cole et al.'s India study demonstrate the causal investment-enabling impact of insurance provision. Development partners including FAO, USAID, and UNDP should pilot index-based agricultural insurance schemes in Eastern Equatoria as a relatively stable site for initial rollout *(Karlan et al., 2014; Cole et al., 2013; Miranda & Farrin, 2012)*

RECOMMENDATION 2: Extend CGSL Loan Tenure to Match Agricultural Investment Horizons

The structural mismatch between short-cycle CGSL lending instruments and multi-season agricultural investment requirements represents an addressable capital market failure. Development partners should work with CGSL networks to introduce medium-term loan products aligned with crop cycle economics, enabling investment in mechanisation, irrigation infrastructure, and other capital-intensive technologies that cannot be financed within single-season loan windows *(Benni, 2021; Chanda, 2024; Malhotra & Baag, 2021)*

RECOMMENDATION 3: Integrate Financial Literacy and Behavioural Training into CGSL Programmes

Given the role of cognitive biases in suppressing investment decisions even when capital is accessible, financial literacy programmes that explicitly address behavioural biases, probability assessment, and loss aversion should be integrated into CGSL programme delivery. Yan et al.'s RCT demonstrates that financial literacy training significantly amplifies the productivity impact of CGSL credit access. Such training should be prioritised in Lakes state, where low educational attainment produces the highest cognitive scarcity burden *(Yan et al., 2025; Muwereza, 2024; van Touch et al., 2024)*

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RECOMMENDATION 4: Gender-Responsive Investment Programming

The 69:31 male-to-female participation ratio indicates substantial suppressed investment potential among female agricultural producers. Development partners should adopt gender-responsive CGSL programming including female membership quotas, women-led savings groups, and targeted credit products aligned with women's investment profiles in both crop and livestock sectors *(Buehren et al., 2019; FAO, 2021)*

Collectively, these recommendations frame an integrated policy agenda in which insurance provision de-risks investment, extended loan tenure makes investment financially viable, financial literacy training makes investment decisions cognitively accessible, and gender-inclusive programming ensures that investment opportunities reach all agricultural producers. This four-pillar agenda addresses the full determinant spectrum mapped in the MDAIDF framework.

7. REFERENCES

Agrawal, S. (2021). Financial inclusion and agricultural productivity in South Sudan: Evidence from rural communities. Journal of African Rural Development, 14(2), 88–109.

Akongdit, A. O. (2019). Community savings and lending in post-conflict South Sudan: Institutional emergence and developmental potential. South Sudan Development Studies, 3(1), 12–34.

Akuel, D. G. (2024). Climate adaptive practices and group savings in South Sudanese agriculture. Environmental Finance in Africa, 6(1), 45–67.

Banerjee, A., & Duflo, E. (2018). Good economics for hard times. PublicAffairs.

Barnett, B. J., Barrett, C. B., & Skees, J. R. (2008). Poverty traps and index-based risk transfer products. World Development, 36(10), 1766–1785.

Bailey, K. D. (1992). Methods of social research (4th ed.). Free Press.

Benni, N. (2021). Digital finance and agricultural lending horizons in Sub-Saharan Africa. FAO Agricultural Finance Working Paper, 2021/3.

Binswanger, H. (1980). Attitudes toward risk: Experimental measurement in rural India. American Journal of Agricultural Economics, 62(3), 395–407.

Binswanger, H., & Rosenzweig, M. (1986). Behavioural and material determinants of production relations in agriculture. Journal of Development Studies, 22(3), 503–539.

Borgomeo, E., Betts, R., & Conway, D. (2023). Climate vulnerability and agricultural adaptation in South Sudan. World Bank Policy Research Working Paper 10312.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101.

Buehren, N., Goldstein, M., Guida, V., & Caria, S. (2019). The impact of strengthening agricultural extension services for women: Evidence from Ethiopia. World Bank Policy Research Working Paper 8739.

Chanda, M. (2024). Structural barriers to agricultural credit uptake in Zambia. African Journal of Rural Finance, 12(1), 34–58.

 | Received: January 2025 | Accepted: March 2025 | Published: June 2025

Cole, S., Giné, X., Tobacman, J., Topalova, P., Townsend, R., & Vickery, J. (2013). Barriers to household risk management: Evidence from India. American Economic Journal: Applied Economics, 5(1), 104–135.

Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). SAGE.

Creswell, J. W., & Plano Clark, V. L. (2017). Designing and conducting mixed methods research (3rd ed.). SAGE.

Dercon, S., & Christiaensen, L. (2011). Consumption risk, technology adoption, and poverty traps: Evidence from Ethiopia. Journal of Development Economics, 96(2), 159–173.

Duflo, E., Kremer, M., & Robinson, J. (2008). How high are rates of return to fertiliser? Evidence from field experiments in Kenya. American Economic Review, 98(2), 482–488.

FAO. (2021). The state of food and agriculture: Making agrifood systems more resilient. Food and Agriculture Organization of the United Nations.

Field, A. (2018). Discovering statistics using IBM SPSS statistics (5th ed.). SAGE.

Giné, X., & Yang, D. (2009). Insurance, credit, and technology adoption: Field experimental evidence from Malawi. Journal of Development Economics, 89(1), 1–11.

Hosmer, D. W., & Lemeshow, S. (2013). Applied logistic regression (3rd ed.). Wiley.

Ilesanmi, K. D. (2024). Agricultural finance and smallholder productivity in Uganda: Evidence from savings group participants. East African Journal of Agricultural Finance, 8(2), 23–47.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. Educational Researcher, 33(7), 14–26.

Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47(2), 263–291.

Karlan, D., Osei, R., Osei-Akoto, I., & Udry, C. (2014). Agricultural decisions after relaxing credit and risk constraints. Quarterly Journal of Economics, 129(2), 597–652.

Li, X., Wang, Y., & Zhang, H. (2024). Savings group participation and technology adoption in Indonesian smallholder agriculture. Asian Journal of Development Finance, 11(1), 12–38.

Malhotra, M., & Baag, P. K. (2021). Linking microfinance institutions with formal banking: Evidence and frameworks. Journal of Financial Inclusion, 14(3), 67–89.

Miranda, M. J., & Farrin, K. (2012). Index insurance for developing countries. Applied Economic Perspectives and Policy, 34(3), 391–427.

Msukwa, C., Mhango, W., & Kambewa, P. (2021). Savings group participation and maize yield improvement in Malawi. Malawi Journal of Agricultural Economics, 18(1), 56–78.

Mullainathan, S., & Shafir, E. (2013). Scarcity: Why having too little means so much. Times Books.

Muwereza, N. (2024). Financial literacy and loan utilisation quality among CGSL members in East Africa. African Microfinance Review, 9(2), 18–42.

Mwasha, A. (2025). Community savings and lending participation and fertiliser adoption in Tanzania. Tanzania Journal of Agricultural Development, 12(1), 34–58.

Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. Journal of Risk and Uncertainty, 1(1), 7–59.

 | Received: January 2025 | Accepted: March 2025 | Published: June 2025

Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. Science, 338(6107), 682–685.

Tashakkori, A., & Teddlie, C. (2010). SAGE handbook of mixed methods in social and behavioural research (2nd ed.). SAGE.

Thaler, R. H. (1999). Mental accounting matters. Journal of Behavioral Decision Making, 12(3), 183–206.

Toch, M. M., & Riak, G. A. (2025). Grassroots financial inclusion: The influence of community group savings and lending on farming productivity in South Sudan. African Food Systems Research, 8(2), forthcoming.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. Quarterly Journal of Economics, 106(4), 1039–1061.

van Touch, S., Kimura, F., & Sasaki, N. (2024). Financial literacy and investment behaviour among rural smallholders in Southeast Asia. Asian Development Review, 41(1), 112–138.

Waweru, G. G., & Njeru, A. (2018). Social capital and financial performance of savings and credit cooperatives in Kenya. African Journal of Finance and Management, 7(2), 45–67.

World Bank. (2022). South Sudan economic update: Pathways to resilience. World Bank Publications.

Yan, X., Liu, H., & Chen, Z. (2025). Financial training, group savings, and agricultural investment: A randomised controlled trial in rural China. Journal of Development Economics, 168, 103245.

 | Received: January 2025 | Accepted: March 2025 | Published: June 2025