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Agricultural Finance, Value Chains and Climate Resilience among Rural Women Farmers in Tanzania: An Integrative Review

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Abstract: Women supply a large share of Tanzania's agricultural labour, yet they remain underrepresented in agricultural lending, commercial value chains and risk-transfer markets. As droughts and erratic rainfall intensify, access to finance increasingly determines whether rural women can invest in adaptation or are pushed further into vulnerability. The review integrates empirical, theoretical and grey literature on rural women farmers' access to and benefits from agricultural finance and value-chain interventions in Tanzania, with particular attention to climate variability. An integrative review following Whittemore and Knafl's five-stage framework was used. Peer-reviewed articles, working papers, national survey reports and programme documents published between 2013 and 2026 were identified through web-based scholarly searching, repository searching and citation chasing. Quality was appraised with the Mixed Methods Appraisal Tool (MMAT) and an adapted AACODS checklist for grey literature. Data were synthesised through constant comparison and thematic analysis. The evidence favours bundled, group-anchored approaches that combine savings, training and collective marketing with measures that put documents, land rights and decision-making power in women's own hands. It is recommended that rigorous, gender-disaggregated impact evaluations of warehouse receipts, insurance and digital credit remain the most pressing research gap.

Keywords: rural women; agricultural finance; value chains; climate resilience; village savings and loan associations; warehouse receipt system; Tanzania; integrative review.

1. Introduction

Agriculture remains the backbone of Tanzania's rural economy, and women carry a substantial share of its labour. Yet women farmers are consistently less productive than men, not because they farm less efficiently but because they have unequal access to land, labour, inputs, information and finance. A joint UN Women, UNDP-UNEP and World Bank study estimated the gender gap in agricultural productivity in Tanzania at 16%, costing the economy about USD 105 million a year (0.46% of GDP); closing it could raise crop output by 2.2% and lift as many as 80,000 people out of poverty annually (UN Women et al., 2015).

Finance sits at the centre of these inequalities. Credit allows farmers to buy improved seed, fertiliser and labour at the start of the season; savings and insurance protect them when harvests fail; and structured marketing instruments such as warehouse receipts allow them to hold produce until prices recover. Tanzania has made considerable progress in financial inclusion: according to FinScope 2023, access to formal financial services reached 89% of adults and usage 76%, up from 86% and 65% in 2017 (Bank of Tanzania, 2025). The national formal-inclusion gender gap has narrowed from about ten to three percentage points (Joseph & Mpambije, 2024). However, these aggregate figures mask persistent exclusion among rural residents, smallholder farmers and women, and they say little about agricultural finance, which carries additional seasonal, collateral and climate risks.

Climate change adds immediacy. Most Tanzanian smallholders rely on rain-fed farming, and droughts, delayed rains and floods already affect yields and incomes. Women are often more exposed because they farm smaller plots, have less secure tenure and have heavier care burdens, while their access to the very resources that enable adaptation, including credit, is more limited (Awoke et al., 2025; Van Aelst & Holvoet, 2016). Finance is a precondition for adaptation and not an optional extra. There is a need to invest upfront in climate-smart agriculture (CSA) practices such as drought-tolerant seed, soil and water conservation and agroforestry.

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While individual studies have explored women's access to credit, savings groups, value chain engagement and CSA adoption in Tanzania, these literatures have evolved largely in parallel. Studies in economics tend to think of credit as a constraint at the household level, studies in gender focus on norms and intra-household bargaining, and studies in climate change on adoption of practices. No review has linked these strands to ask how financial instruments, value-chain structures and climate risk interact in shaping rural women's economic outcomes. An integrative review is well suited to this task as it allows diverse designs, including quantitative surveys, quasi-experimental evaluations, qualitative case studies and program reports, to be synthesized into a more complete understanding of a complex phenomenon (Whittemore & Knafl, 2005).

The question that steered the review was: What does the evidence say about access to, and benefits from, agricultural finance and value-chain interventions by rural women farmers in Tanzania, especially when considering climate variability? The analysis was organized around three sub-questions: (a) What are the barriers and enablers to women accessing agricultural finance? (b) What is the effect of finance and value-chain interventions on women's income, control over resources, and agency? (c) How does finance facilitate women's adaptive capacity to climate variability?

2. Methods

2.1 Review design

The review followed the five stages of Whittemore and Knafl's (2005) integrative review method: problem identification, literature search, data evaluation, data analysis and presentation. Reporting was informed by the PRISMA 2020 statement (Page et al., 2021), adapted for an integrative design that includes non-experimental and grey literature. Women's empowerment was conceptualised using Kabeer's (1999) resources, agency and achievements framework, which allowed the review to distinguish between women gaining *access* to financial resources, exercising *agency* over their use, and realising *achievements* such as higher income or adaptive capacity.

2.2 Problem identification

The review question was framed using the PICo (Population, phenomenon of Interest, Context) format. The population was rural women engaged in crop or livestock farming; the phenomena of interest were agricultural credit, savings groups, insurance, warehouse receipts, collective marketing and value-chain participation, together with their links to climate adaptation; and the context was mainland Tanzania and Zanzibar.

2.3 Literature search

Searches were conducted in October 2026 using web-based scholarly searches across publisher platforms (Elsevier, Taylor & Francis, Wiley, Frontiers, Springer, Cambridge), open repositories (PubMed Central, AgEcon Search, RePEc/IDEAS, CGSpace, IDS OpenDocs, Tanzanian university repositories) and institutional archives (IFPRI, APRA/Future Agricultures Consortium, UNU-WIDER, REPOA, FSDT, UN Women, NORC). Citation chasing of included studies supplemented the electronic search. Table 1 summarises the search strategy and eligibility criteria.

Table 1. Search Strategy and Eligibility Criteria

Element	**Specification**
Search string (core)	(women OR gender OR female) AND (credit OR loan OR finance OR savings OR VSLA OR VICOBA OR insurance OR "warehouse receipt" OR "value chain" OR commercialisation) AND (farmer *OR agricultur* OR smallholder) AND Tanzania
Climate extension	AND (climate OR drought OR adaptation OR "climate-smart" OR resilience)
Time frame	January 2013 to October 2026
Language	English
Include	Empirical studies (quantitative, qualitative, mixed methods, quasi-experimental), national survey reports, working papers and programme evaluations that report gender-disaggregated findings on agricultural finance or value-chain participation in Tanzania (alone or as a separately reported country in a multi-country study)
Exclude	Studies without gender-disaggregated results; urban-only or non-agricultural enterprise finance; opinion pieces and news without primary data; reports whose authorship or methods could not be verified

Note: Asterisk (*) denotes truncation. Strings were adapted to the syntax of each platform.

2.4 Study Selection

Records were exported, de-duplicated and screened in two stages: titles and abstracts, then full texts. First, all 176 records from the electronic searches and citation chasing were combined into a single library. Duplicates were identified by matching titles, authors, year, and, where available, DOIs, and 47 were removed. The remaining 129 titles and abstracts were then screened against the eligibility criteria in Table 1. At this stage, records were excluded if they clearly did not concern Tanzania, had no gender dimension, or did not address agricultural finance or value-chain participation. Records whose eligibility was uncertain were carried forward rather than excluded, to avoid discarding potentially relevant evidence on the basis of brief or incomplete abstracts. In the second stage, the full texts of the 48 retained reports were read in full to confirm that they reported gender-disaggregated findings and that their authorship, data source and methods could be verified. Where several outputs drew on the same dataset (for example, a working paper and a subsequent journal article from the APRA sunflower study), they were treated as one study, with the peer-reviewed journal article as the primary source and the earlier output used only for supplementary detail not reported elsewhere. This prevented the same participants and findings from being counted twice, which would have given those findings undue weight in the synthesis. Reasons for exclusion at the full-text stage were recorded for each report to keep the selection process transparent and reproducible. Figure 1 presents the selection process, including the number of records retained and excluded at each stage.

2.5 Data Evaluation

Peer-reviewed and working-paper studies were appraised with the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018), which provides design-specific criteria for qualitative, quantitative non-randomised, quantitative descriptive and mixed-methods studies. Grey literature was appraised using the AACODS criteria (authority, accuracy, coverage, objectivity, date, significance). Each report was rated high, moderate or low. Consistent with integrative review practice, no study was excluded on quality grounds alone; instead, quality ratings were used to weight findings during synthesis, with greater confidence placed in conclusions supported by higher-quality and convergent sources.

2.6 Data Analysis and Synthesis

Data were extracted into a matrix recording author, year, design, location, sample, financial mechanism, outcomes and key gender-related findings (Table 2). Analysis followed Whittemore and Knafl's (2005) constant comparison approach: data were reduced and displayed by sub-question, compared across designs to identify patterns, contrasts and contradictions, and then drawn together into themes using reflexive thematic analysis (Braun & Clarke, 2006). Quantitative findings were not pooled statistically because of heterogeneity in measures and designs; instead, they were narratively integrated with qualitative findings to explain *why* observed gaps arise.

3. Results

3.1 Search Outcomes

The searches identified 176 records (162 from web-based scholarly searching and 14 from citation chasing and grey literature). After removing 47 duplicates, 129 records were screened by title and abstract, of which 81 were excluded. Forty-eight full texts were assessed, and 28 were excluded, most commonly because results were not disaggregated by gender. Twenty reports were included in the synthesis (Figure 1).

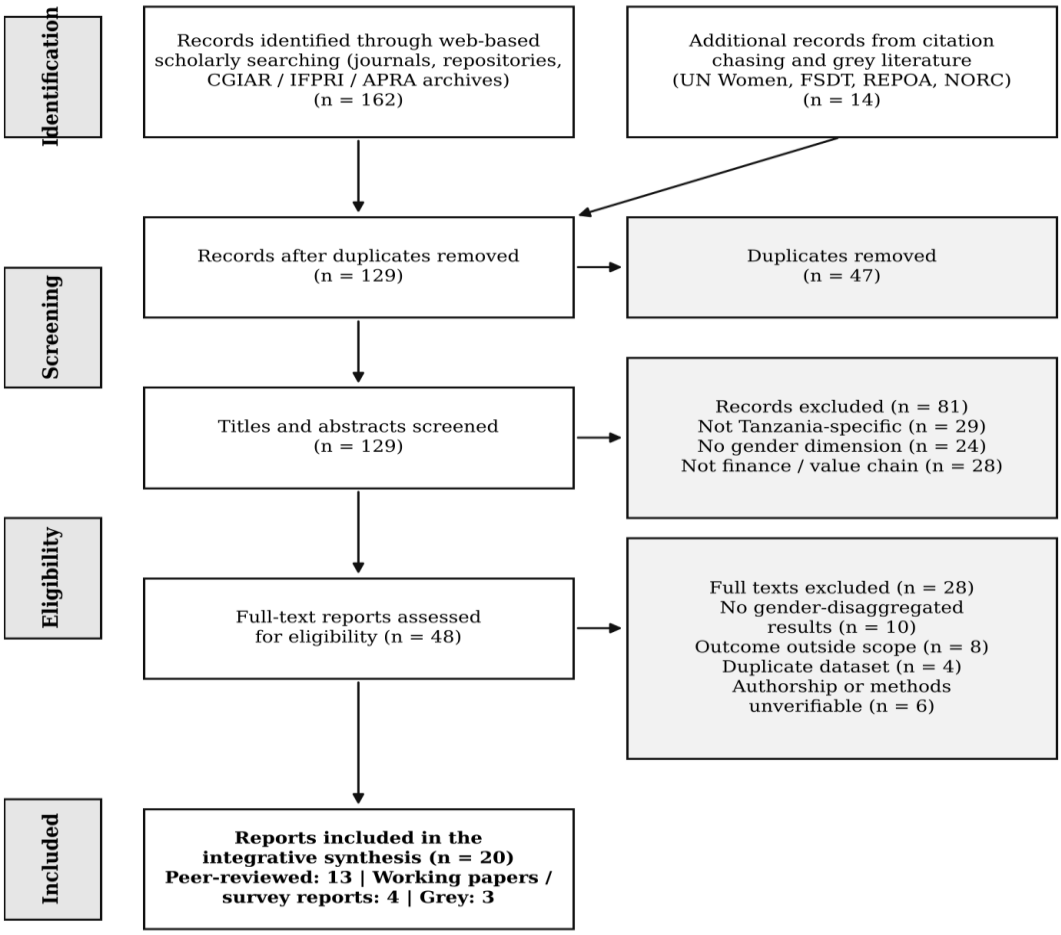


Figure 1. PRISMA flow diagram of report identification, screening and inclusion

Source: Author's search log, adapted from Page et al. (2021).

3.2 Characteristics of Included Reports

The 20 included reports comprised seven mixed-methods studies, four quantitative surveys, one quasi-experimental difference-in-differences evaluation, two qualitative studies, three secondary analyses of national or multi-country data, and three programme or policy documents (Figure 2a). The evidence base is recent and growing: nine reports were published in 2025 or 2026 (Figure 2b). Primary studies were conducted in at least ten regions, with clusters in the central semi-arid zone (Dodoma, Singida), the Southern Highlands (Iringa, Mbeya, Songwe), Morogoro, the north (Kilimanjaro, Manyara, Mara) and the west (Katavi). Sample sizes for primary surveys ranged from 162 to 882 respondents. The financial mechanisms examined were formal agricultural credit, savings groups, land documentation as collateral, collective marketing and warehouse receipts, and insurance, with several reports covering more than one. Table 2 summarises each report.

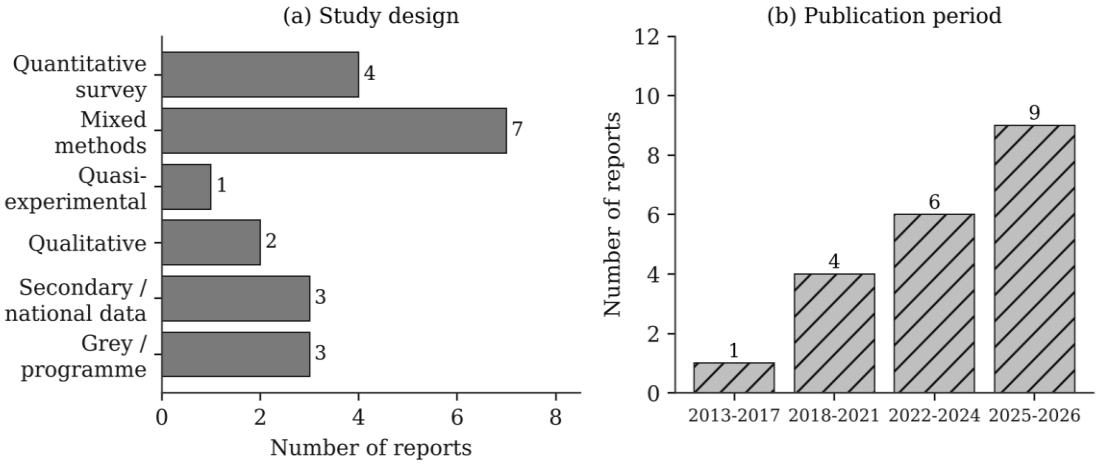


Figure 2. Profile of the 20 included reports by (a) study design and (b) publication period

Source: Author's analysis of included reports.

Table 2. Characteristics and Key Findings of Included Reports (n = 20)

Report	Design and setting	Sample	Mechanism	Key findings relevant to women
Adam et al. (2020)	Mixed methods; maize value chain, Tanzania	551 HH; KIIs; FGDs	Value-chain participation	Higher nodes (trading, processing) are dominated by men; women are largely confined to production and face barriers to entering and expanding trading businesses.
Asiseh et al. (2025)	Secondary analysis; five SSA countries incl. Tanzania	National household surveys	Agricultural credit	Gender gap in agricultural credit access of 8.77 percentage points in Tanzania; countries with average access below 70% show the largest gaps.
Awoke et al. (2025)	Mixed methods; Chamwino and Kongwa (Dodoma)	380 HH; 12 FGDs (75 participants)	Credit, groups, CSA	51% of female-headed vs 38% of male-headed households adopted no CSA practice; women lacked loan documents and were removed from a collective loan group; no female extension officers.
Balana et al. (2022)	Quantitative survey; Ethiopia and Tanzania	882 respondents (Tanzania)	Agricultural credit	Women more likely to be credit constrained on both supply and demand sides; in Tanzania, being female increased demand-side constraint; credit was binding for technology adoption.
Isaga (2018)	Quantitative survey; Mvomero (Morogoro)	162 farmers	Bank credit	Only 8.6% accessed bank credit; gender, education and value of farm assets were significant determinants; women were over-represented among the few borrowers.

Report	Design and setting	Sample	Mechanism	Key findings relevant to women
Jeckoniah et al. (2020)	Mixed methods; Mngeta, Kilombero (Morogoro)	Household survey; FGDs	Rice commercialisation	Women faced resource and cultural barriers to capturing gains from rice commercialisation; improved access to land and capital for women was recommended.
Kweka (2025a)	Qualitative; northern Tanzania	Interviews; FGDs	Value-chain programmes	Empowerment is understood differently by programmes and participants; gender-sensitive design is needed for economic gains to translate into social empowerment.
Kweka (2025b)	Qualitative; Hai (Kilimanjaro), vanilla	Women vanilla producers	Informal vs cooperative marketing	Women vanilla producers face multiple gendered constraints; formalising the chain through cooperative marketing, advisory services and integration into organised markets recommended.
Mosha et al. (2022); Mosha et al. (2021)	Mixed methods; Iramba and Mkalama (Singida)	600 HH heads; 205 FGD participants; 15 villages	Sunflower commercialisation	Sunflower commercialisation had a positive but non-significant effect on empowerment; whole-farm commercialisation was significant because women retain control of non-cash crops; women's control over land 22.5%.
National Bureau of Statistics survey (The Guardian, 2026)	National survey (AASS-WEN 2023/24)	Nationally representative	Financial services and credit	80.4% of men vs 62.3% of women used financial services; 56.9% of rural vs 80.0% of urban women; credit participation 39.6% among rural women vs 60.4% among urban women.
Nchanji et al. (2025)	Quantitative survey; Mbeya Rural and Mbozi	364 bean farmers	Inputs and CSA	Men dominated household adaptation decisions owing to control of land and support services; women's lower education and technology access limited CSA uptake.
Ndosi et al. (2026)	Mixed methods; Tarime (Mara) and Mpimbwe (Katavi)	278 women; 4 FGDs; 5 KIIs	Credit, extension, CSA	72.4% of women reported no access to credit or financial services; credit access ($\beta = 0.201$, $p = 0.009$) and training significantly raised CSA adoption levels.
NORC (2023)	Mixed-methods evaluation; Iringa Rural	Impact-evaluation panel; interviews	CCROs as collateral	Wide gender disparities in borrowing persisted; lenders reported that women rarely held collateral in their own names, even where customary land was documented.

Report	Design and setting	Sample	Mechanism	Key findings relevant to women
Pamuk et al. (2022)	Quasi-experimental (DiD); Iringa	603 HH; 33 villages	VSLAs with farmer field and business schools	VSLA membership rose to 50% in project vs 32% in control villages; loans and savings more than doubled; CSA adoption effects were stronger in households with higher women's empowerment scores.
REPOA (2024)	Quantitative survey; maize farmers	384 farmers	Crop insurance	Higher subscription reported among women (61.45%), although uptake was also described as gender-biased; widowhood reduced participation by 20.8 percentage points; national agricultural insurance coverage below 0.01%.
Stein et al. (2024)	Longitudinal field study; Babati (Manyara)	Field evidence collected over nine years	Land titling (CCROs)	Fewer than one-third of respondents held finalised CCROs five years after titling; banks would not lend against CCROs; women's land rights did not improve.
UN Women (2025)	Programme report; sunflower value chain	Programme monitoring data	Warehouse receipts; collective marketing	A cooperative sunflower warehouse (Mnang'ana AMCOS), licensed in 2024, stored over 1,000 tonnes in 2024, raising prices about 50% above informal markets and improving women's bargaining power and market information.
Van Aelst & Holvoet (2016)	Mixed methods; four villages, Morogoro	Survey; interviews	Adaptive strategies (diversification, intensification, migration)	Women's access to adaptive strategies depended strongly on marital status (widows most constrained), while men's did not.
Were et al. (2021)	Secondary analysis; FinScope 2017	Nationally representative	Formal financial inclusion	Women, especially married women, were less likely to access formal financial services; savings groups and financial literacy recommended.
InsuResilience Solutions Fund (2025)	Pre-feasibility study; national	Document review; stakeholder consultation	Index-based insurance	Index insurance judged the most feasible model; women-headed households reported to be adopting insurance where targeted marketing and financial literacy are provided.

Abbreviations: CCRO, Certificate of Customary Right of Occupancy; CSA, climate-smart agriculture; DiD, difference-in-differences; FGD, focus group discussion; HH, households; KII, key informant interview; SSA, sub-Saharan Africa; VSLA, village savings and loan association.

3.3 Quality of the Evidence

Seven reports were rated as high quality, nine moderate and four low (Table 3). Strengths included large and randomly drawn samples in several surveys, the use of control villages in Pamuk et al. (2022), and triangulation of survey and focus group data in most mixed-method studies. They often mentioned weaknesses such as cross-sectional designs that cannot establish causality, reliance on a single household respondent to report on women's empowerment, purposive site selection, and limited reporting of qualitative analytic procedures. The program documents provided useful implementation detail but were written by implementing agencies and were not independently verified.

Table 3. Summary of Quality Appraisal

Report	Appraisal tool/category	Rating	Main limitation
Pamuk et al. (2022)	MMAT quantitative non-randomised	High	Single respondent reported women's empowerment; control villages not randomised
Balana et al. (2022)	MMAT quantitative descriptive	High	Cross-sectional; irrigation-focused sampling
Awoke et al. (2025)	MMAT mixed methods	High	Intervention villages purposively selected
Mosha et al. (2022)	MMAT mixed methods	High	2018 data; household head as respondent
Van Aelst & Holvoet (2016)	MMAT mixed methods	High	Four villages limit generalisability
Were et al. (2021)	MMAT quantitative descriptive	High	2017 data predate recent digital expansion
Asiseh et al. (2025)	MMAT quantitative descriptive	High	Household headship used as gender proxy
Adam et al. (2020)	MMAT mixed methods	Moderate	Limited detail on qualitative analysis
Nchanji et al. (2025)	MMAT quantitative descriptive	Moderate	Two districts; no finance-specific outcome
Ndosi et al. (2026)	MMAT mixed methods	Moderate	Self-reported adoption scale; women-only sample prevents gender comparison
Jeckoniah et al. (2020)	MMAT mixed methods	Moderate	Working paper; single division
Stein et al. (2024)	MMAT mixed methods	Moderate	One district; critical stance stated a priori
NORC (2023)	AACODS	Moderate	Commissioned by funder of the titling programme
REPOA (2024)	MMAT quantitative descriptive	Moderate	Sampling and site details limited
National survey via The Guardian (2026)	AACODS	Moderate	Secondary press report of official statistics
Isaga (2018)	MMAT quantitative descriptive	Moderate	Purposive sample; single district
Kweka (2025a)	MMAT qualitative	Low	Sampling and analysis insufficiently described
Kweka (2025b)	MMAT qualitative	Low	Small, purposive sample
UN Women (2025)	AACODS	Low	Implementer self-report; no comparison group
InsuResilience Solutions Fund (2025)	AACODS	Low	Feasibility study; gender claims not supported by primary data

MMAT, Mixed Methods Appraisal Tool (Hong et al., 2018); AACODS, authority, accuracy, coverage, objectivity, date, significance.

3.4 Thematic synthesis

Constant comparison across the 20 reports produced six themes (Table 4). They are presented below, moving from the extent of exclusion, through its causes and the instruments that partly overcome it, to its consequences for climate resilience.

Table 4. Themes, Sub-Themes and Contributing Reports

Theme	Sub-themes	Contributing reports
1. A persistent, rural-concentrated gender gap in agricultural finance	Supply- and demand-side constraints; rural-urban divide; marital status	Asiseh et al. (2025); Balana et al. (2022); The Guardian (2026); Isaga (2018); Ndosi et al. (2026); Were et al. (2021)
2. Collateral, land and documentation as the binding constraint	Land-based collateral; limits of CCROs; missing documents	Awoke et al. (2025); NORC (2023); Stein et al. (2024); Mosha et al. (2022)
3. Group-based finance as women's entry point	VSLA and VICOBA access; bundling with training; exclusion from formal group loans	Pamuk et al. (2022); Balana et al. (2022); Awoke et al. (2025); Were et al. (2021)
4. Commercialisation without control	Male dominance of higher nodes; loss of control as crops commercialise; collective marketing and warehouses	Adam et al. (2020); Mosha et al. (2022); Jeckoniah et al. (2020); Kweka (2025a, 2025b); UN Women (2025)
5. Finance as an enabler of climate adaptation, mediated by agency	Credit and CSA adoption; intra-household decisions; widowhood and marital status	Ndosi et al. (2026); Awoke et al. (2025); Nchanji et al. (2025); Pamuk et al. (2022); Van Aelst & Holvoet (2016)
6. Insurance: thin and contested evidence	Very low coverage; gendered uptake; product design	REPOA (2024); InsuResilience Solutions Fund (2025); Balana et al. (2022)

Theme 1: Persistent Rural Gender Gap in Agricultural Finance

All quantitative sources that broke down the results by gender found women at a disadvantage, although the size of the gap varied with the measure. Across five countries, a multi-country analysis found that Tanzania's gender gap in access to agricultural credit was 8.77 percentage points, the third largest (Asiseh et al., 2025). The latest national data show a bigger gap in the overall usage of financial services: 80.4% of men versus 62.3% of women, with rural women (56.9%) lagging behind urban women (80.0%) by more than 23 points and being much less likely to take part in credit (39.6% vs 60.4%) (The Guardian, 2026). Among women maize farmers in Mara and Katavi, 72.4% said they had no access to credit or financial services at all (Ndosi et al., 2026). The gap is, therefore, not only between women and men, but also, quite sharply, between rural and urban women (Figure 3).

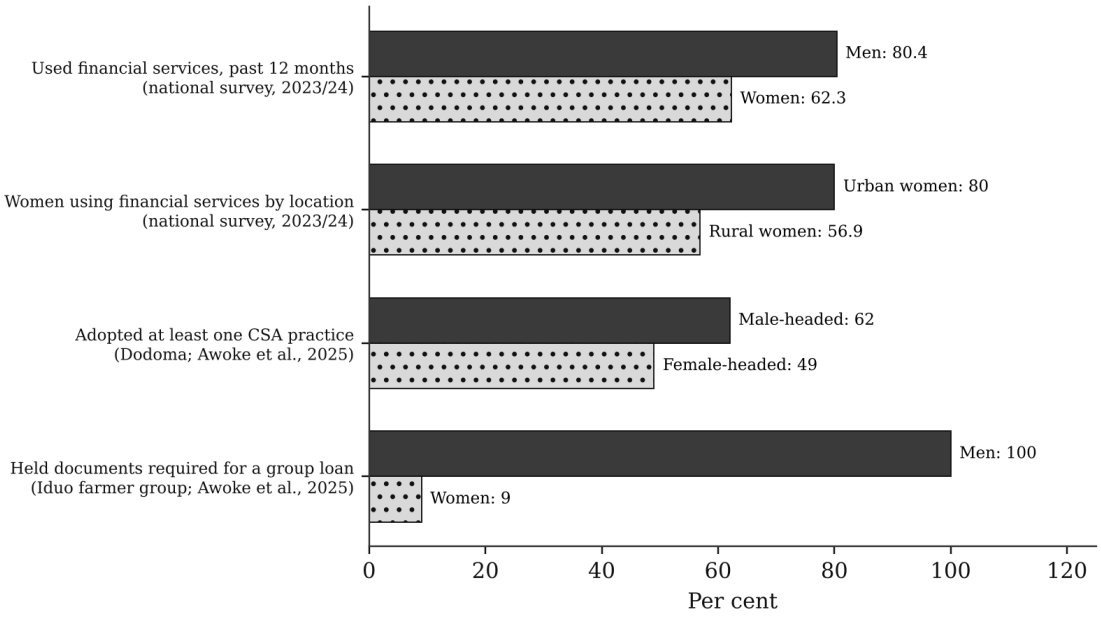


Figure 3. Selected gender and location gaps in finance-related indicators reported in included studies

Sources: National Bureau of Statistics AASS-WEN 2023/24 as reported in The Guardian (2026); Awoke et al. (2025). Indicators come from different samples and are not directly comparable across rows.

The literature revisits reasons for the gap among women farmers. Demand-side constraints, such as risk aversion, high transaction costs and expectations of rejection were as important as supply-side rationing, according to Balana et al. (2022), who also found that being female increased the likelihood of demand-side constraints in Tanzania specifically. Not only do women fail to get loans but many refuse to apply because the perceived risk of losing assets, or the effort of complex procedures, exceeds the expected gain. Were et al. (2021) found that married women were less likely to access formal finance than other women, suggesting that household position rather than gender alone shapes exclusion.

However, there is one study that bucked this trend. In Mvomero, Isaga (2018) found that only 8.6% of 162 smallholders had bank credit, although women were over represented in this small group of borrowers. The contradiction is instructive rather than anomalous: the purposive sample was small and where women do access formal credit, it is often through women-targeted microfinance products or group guaranties rather than individual bank lending. The finding warns against assuming the gender gaps are the same across all lenders and products.

Theme 2: Collateral, Land and Documentation as the Binding Constraint

Across designs, the most consistent mechanism behind credit exclusion was the absence of collateral in women's names. In Singida, women-controlled land in only 22.5% of cases and their access to land through customary arrangements was dependent on marital stability (Mosha et al., 2021). Dodoma offered qualitative evidence of how this plays out. In one group of 22 women and 11 men trying to get a group loan, 9% of women but all men had the documents lenders needed, and the women were removed from the group so the loan could go ahead (Awoke et al., 2025). Thus, the lack of collateral excludes women not only from individual credit but also from the groups that are intended to overcome individual collateral constraints.

Tanzania's Village Land Act provides for Certificates of Customary Right of Occupancy (CCROs) that were supposed to secure women's tenure and unlock credit. The evidence on this promise is sobering stuff. In Babati, nine years of fieldwork showed that less than a third of respondents had finalized CCROs five years after a World Bank-supported titling program, that mainstream banks were not ready to lend against them, and that women's land rights had not improved (Stein et al., 2024). An evaluation conducted in Iringa under the auspices of USAID also found large and persistent gender disparities in borrowing; lenders reported that women rarely held collateral in their own names even when land had been documented (NORC, 2023). National analysis shows that formal documents increase land values by more than 25% and can reduce collateral constraints (Aikaeli et al., 2022). However, the studies included here suggest these benefits have been largely accrued by men and larger landholders.

Theme 3: Group-Based Finance as Women's Entry Point

Where formal credit was unavailable, community-based savings groups were the conduit for access to finance for most rural women. The strongest evidence comes from Pamuk et al.'s assessment of a CARE program in Iringa that

integrated farmer field and business schools with village savings and loan associations (VSLAs) using a difference-in-differences approach (Pamuk et al., 2022). By endline, 50% of farmers in project villages were members of a VSLA compared to 32% in control villages. Project farmers were 14 percentage points more likely to have taken a loan and 20 points more likely to have saved, and the amounts borrowed and saved more than doubled. Conversely, only 2-4% of the farmers took bank credit. Similarly, Balana et al. (2022) found local association participation reduced supply-side credit constraints in Tanzania.

The savings-group evidence also shows limits. Loans were small, averaging less than TZS 100,000 (about USD 35) even in project villages, and used as often for non-farm businesses as for farming (Pamuk et al., 2022). Thus, savings groups can smooth consumption and build women's confidence and leadership, but they rarely fund the larger investments such as irrigation or storage that transform farm productivity. Moreover, as the Dodoma case illustrates, when groups attempt to move to formal credit, the same documentation barriers that exclude women individually can reappear within the group (Awoke et al., 2025).

Theme 4: Commercialisation Without Control

Value-chain studies have revealed a striking pattern: commercialization increases women's participation in agricultural markets but does not necessarily increase their control over income. Higher value nodes in the maize value chain (trading, processing and retail) were dominated by men, while women remained concentrated in production (Adam et al., 2020). In Singida, commercialization of sunflower had a positive but statistically non-significant effect on women's empowerment, while commercialization of all crops had a significant positive effect since women retained control over food crops even when these were sold (Mosha et al., 2022). Research on rice commercialization in Kilombero also identified resource and cultural barriers for women to access the benefits (Jeckoniah et al., 2020). It implies that men take over as a crop becomes lucrative. Women's bargaining position depends on having a diversified portfolio rather than on specialization.

Collective marketing would seem to be a partial remedy. Qualitative work in Hai District suggested the need for formalizing the vanilla value chain through cooperative marketing and integrating women in organized markets (Kweka, 2025b). In 2024, a cooperative sunflower warehouse in Mnang'ana village, licensed by the Warehouse Receipts Regulatory Board, stored more than 1,000 tons and fetched prices some 50% above informal market rates, while improving women's access to market information and bargaining power, according to UN Women program data (UN Women, 2025). The warehouse receipt system can also allow farmers to borrow against stored produce instead of land (William & Kaserwa, 2015) which could potentially overcome the collateral barrier discussed in Theme 2. However, none of the included studies rigorously evaluated the gendered effects of warehouse receipts and the available evidence is from implementing agencies.

Theme 5: Finance as a Climate Adaptation Enabler: Mediated by Agency

Studies on climate-smart agriculture consistently identified access to credit as a determinant of adoption among women. Credit access, training and frequency of extension contact greatly increased the level of CSA adoption amongst women farmers in Mara and Katavi with self-efficacy having been found to have the largest effect of all (Ndosi et al., 2026). The practices that gave the quickest and most visible returns, such as drought-tolerant seed and better post-harvest handling, were the most widely adopted, while rainwater harvesting, agroforestry and mulching, which require investment up front and a longer payback period, were the least adopted. In Dodoma, 51% of households headed by females adopted no CSA practice at all compared with 38% of households headed by males; female-headed households cultivated less land (1.68 compared with 3.01 hectares) and reported limited access to credit, training and groups (Awoke et al., 2025).

However, it is also clear that finance does not translate into adaptation unless women are able to decide how it is used. In Dodoma, women in married households made sole decisions on crop choice in only 8% of cases and on sales in only 6% (Awoke et al., 2025). Household adaptation decisions were male-dominated among bean farmers in the Southern Highlands because men-controlled land and support services (Nchanji et al., 2025). Pamuk et al. (2022) provide quasi-experimental support for this mechanism. The effect of combined training and VSLA finance on CSA adoption was significantly larger in households with higher women's empowerment scores. The authors conclude that external finance can trigger adoption but women's agency anchors it. Marital status cuts across these dynamics, add Van Aelst and Holvoet (2016): Widows had the narrowest access to adaptive strategies, and the position of divorced women differed from that of married women.

Theme 6: Insurance: Thin and Contested Evidence

There are a lot of risks in agriculture that need to be cushioned. Insurance is usually promoted as a tool for managing climate risks and for cushioning credit risks, yet evidence on this tool on its gender dimensions is limited in the Tanzanian context. National coverage of agricultural insurance was reported to be less than 0.01% (REPOA, 2024). Within a sample of 384 maize farmers, a higher share of women (61.45%) subscribed, but the authors also reported gender-biased uptake, and widowhood reduced the likelihood of participation by 20.8 percentage points (REPOA, 2024). A national feasibility study considered index-based insurance the most feasible model for Tanzania and reported that women-headed households were adopting

insurance where marketing and financial literacy were targeted to them (InsuResilience Solutions Fund, 2025), although this claim was not supported by primary data. Balana et al. (2022) recommended crop insurance in particular as a way to reduce the demand-side, risk-related credit constraints that disproportionately affect women. In sum, these sources propose that insurance may be more accessible to women than credit because it requires no collateral; however, its affordability, trust and design for women's crops remain untested in rigorous studies.

4. Discussion

4.1 Integrating the Findings

This review set out to bring together literature on credit, savings groups, value chains and climate adaptation that have largely developed separately. Read through Kabeer's (1999) framework, the synthesis shows that interventions have made more progress on *resources* than on *agency* or *achievements*. Savings groups and, increasingly, mobile and microfinance products have widened women's access to small amounts of finance. But the conversion of that access into control over income, investment in climate-resilient practices and lasting economic gains is blocked at two points: the collateral and documentation that formal lenders require, and the intra-household and market power relations that determine who controls productive assets and cash-crop income.

Figure 4 summarises these relationships. Structural conditions (customary tenure, gender norms, low literacy and climate variability) shape women's access to four families of financial instruments. Whether those instruments produce outcomes depends on mediating processes: intra-household decision-making, collective action, extension and self-efficacy, and control over income from commercialised crops. The model highlights why supply-side expansion of credit alone, the dominant policy response, is insufficient.

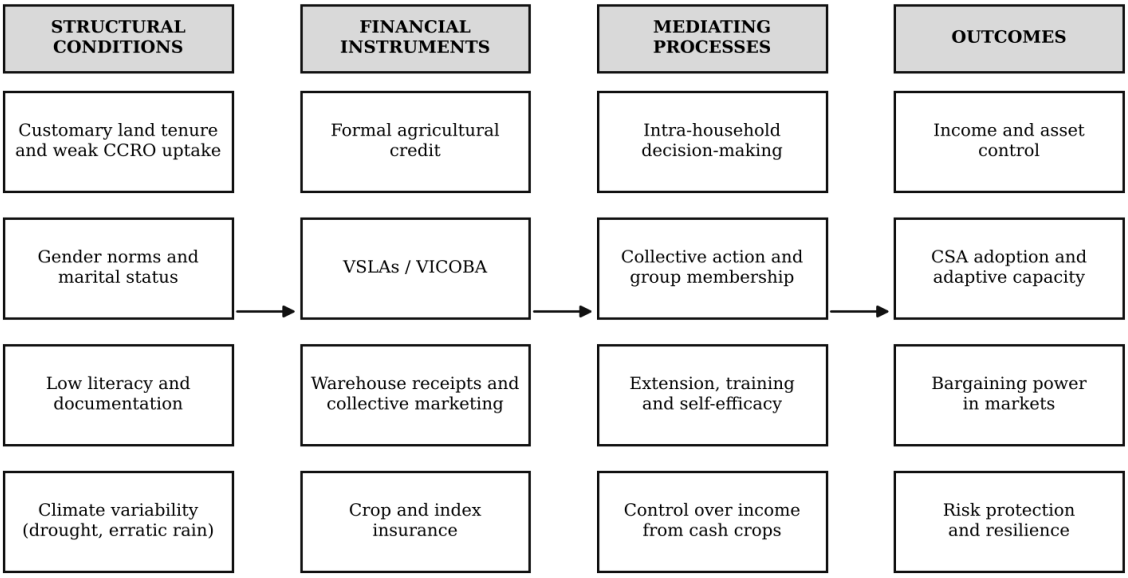


Figure 4. Conceptual model synthesising pathways from structural conditions to women's economic and adaptive outcomes

Source: Author's synthesis of the 20 included reports.

Three findings are worth particular emphasis. First, the persistence of demand-side constraints (Balana et al., 2022) suggests that access to credit alone does not ensure that women will take it up; risk-reducing features, simpler procedures and complementary insurance matter as much as the supply of loans. Second, evidence from the CCRO (NORC, 2023; Stein et al., 2024) indicates that formalizing land is not the same as formalizing women's land and that documents banks do not accept cannot be used as collateral. To achieve its gender objectives, land formalization would need joint or women-only titling and lender acceptance of CCROs. Third, the commercialization studies (Adam et al., 2020; Mosha et al., 2022) indicate that value-chain programs risk transferring control of newly profitable crops to men, unless they are deliberately designed to protect women's ownership of output and income, for example, through women-registered cooperative accounts or warehouse receipts issued in women's names.

Evidence also suggests that bundled approaches are the most promising. The intervention with the best evaluation design (Pamuk et al., 2022) combined savings, training and gender

dialog among couples, and had the largest effects when women's empowerment was highest. Likewise, collective marketing and warehousing (UN Women, 2025) combined finance, market access and group voice. These findings are consistent with wider gender and socially inclusive climate-resilient agriculture frameworks (Huyer et al., 2021).

4.2 Implications for Policy and Practice

Table 5 translates the synthesis into actions for key stakeholders, linking each recommendation to the evidence that supports it.

Table 5. Implications for Policy and Practice

Stakeholder	Recommended action	Supporting evidence
Ministry of Lands; local governments	Promote joint and women-only CCROs and require spousal consent for transactions; work with the Bank of Tanzania to make CCROs acceptable collateral	Stein et al. (2024); NORC (2023); Mosha et al. (2021)
Banks and microfinance institutions	Offer movable-asset, harvest-based and group-guaranteed products that do not depend on land; simplify procedures to reduce demand-side constraints	Balana et al. (2022); Awoke et al. (2025); Isaga (2018)
NGOs and savings-group promoters	Link VSLAs to agricultural training and input suppliers; create graduation pathways to larger loans that protect women members	Pamuk et al. (2022); Awoke et al. (2025)
Cooperatives and Warehouse Receipt Regulatory Board	Issue receipts and payments in women's own names; set targets for women's membership and leadership	UN Women (2025); Adam et al. (2020); Kweka (2025b)
Ministry of Agriculture; extension services	Recruit female extension officers; deliver couples-based training on decision-making; prioritise low-cost, quick-return CSA practices	Awoke et al. (2025); Ndosi et al. (2026); Nchanji et al. (2025)
Insurers and regulators	Pilot index insurance bundled with credit and tailored to women's crops; target widows explicitly	REPOA (2024); InsuResilience Solutions Fund (2025)
National Bureau of Statistics; FSDT	Publish agricultural finance indicators disaggregated by sex, location and marital status	Were et al. (2021); The Guardian (2026)

4.3 Gaps in the Evidence

The review identified several gaps. Only one included study used a comparison group, and none was a randomised trial; causal claims about the effects of finance on women's outcomes therefore rest on a thin base. No study rigorously evaluated the gender effects of the warehouse receipt system, contract farming or digital agricultural credit, even though these are expanding rapidly. Most studies measured empowerment through a single household respondent or through household headship, which obscures the situation of women in male-headed households, who are the majority. Evidence from Zanzibar, pastoralist women and women in fisheries value chains was absent. Finally, few studies followed women over time to establish whether access to finance improved resilience through an actual climate shock.

4.4 Strengths and Limitations

The review's main strength is its integration of quantitative, qualitative and grey sources across fields that rarely speak to one another, allowing it to explain as well as describe gender gaps. Quality appraisal with established tools and explicit treatment of contradictory findings add to its credibility. Several limitations should be noted. The search relied on web-based scholarly search, open repositories and institutional archives rather than structured searches of subscription databases such as Scopus, Web of Science, CAB Abstracts or AGRIS, so relevant studies may have been missed; the identification counts in Figure 1 reflect this search process. Screening and appraisal were conducted by a single reviewer, which raises the risk of selection and interpretive bias. Only English-language sources were included, which may exclude Kiswahili reports and theses. Some figures came from secondary reports of primary data (for example, national survey results reported in the press), and a minority of included studies were of low quality. Readers should treat the findings as a well-grounded map of the evidence rather than a definitive estimate of effects.

5. Conclusion

Rural women in Tanzania have gained more access to finance over the past decade, mostly through savings groups and microfinance, but the evidence reviewed here shows that access has not yet translated into proportional control over agricultural income or into equal capacity to adapt to a changing climate. The binding constraints are less about the supply of credit than about the collateral, documents and decision-making power that women lack, and about value-chain structures that shift control to men as crops become profitable. Interventions that combine finance with training, collective marketing and deliberate measures to vest assets and income in women's own names show the greatest promise. As climate shocks intensify, ensuring that women farmers can borrow, save, insure and sell on fair terms is not only a matter of equity but a central condition for the resilience of Tanzania's food system.

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