



Price Volatility, Merchant Financing and Farmer Welfare: Evidence from Tobacco Marketing Systems in Makonde District, Zimbabwe

Dr. Tapiwa Joel Furusa¹, Takawira Chirume², Takudzwa Nyabeze³

¹PhD, Binary University, Malaysia

²PhD Candidate, Durban University of Technology, South Africa

³Ministry of Women Affairs, Zimbabwe

DOI: <https://doi.org/10.68050/JAMS.2026.122>

Received: 06 September 2026; Accepted: 12 September 2026; Published: 02 October 2026

ABSTRACT

Zimbabwe's tobacco industry generates substantial export earnings, yet aggregate production growth does not necessarily improve smallholder welfare. This study examines associations between tobacco pricing, merchant-sponsored finance, production costs and farmer welfare in Makonde District, Mashonaland West Province. A pragmatic, cross-sectional mixed-methods design combined 281 usable questionnaires from registered tobacco farmers with ten key-informant interviews involving regulatory, extension and merchant representatives. Farmer welfare was operationalised as an unweighted mean of nine five-point perception items covering income adequacy, food security, education, health care, housing, assets, savings, financial resilience and satisfaction with net market returns. Content mapping, instrument review, piloting and qualitative convergence supported interpretive validity, although the index was not benchmarked against verified household accounts. Farmers reported severe cost pressure (mean = 4.50), weak pricing outcomes (2.21) and below-midpoint welfare (2.86). Pricing was positively associated with welfare ($r = .732$), merchant finance had a moderate positive association ($r = .491$), and production costs were negatively associated with welfare ($r = -.684$), all $p < .001$. The reported model explained 71.4% of sample variation in perceived welfare. Because the evidence is cross-sectional, perception-based and district-specific, these estimates are associational rather than causal or nationally representative. The findings nevertheless expose a production-welfare paradox: contracts sustain output while costs, opaque settlements and unequal value-chain governance restrict value retained by households. Policy should prioritise grade-level price disclosure, standard contract summaries, auditable settlement statements, competitive agricultural credit and collective farmer bargaining, while future panel research validates perceived welfare against income, assets, food security, debt and net-margin records.

Keywords: tobacco marketing; price volatility; contract farming; production costs; farmer welfare; value-chain governance; Makonde District; Zimbabwe

INTRODUCTION

Tobacco remains a commercially important but politically and ethically contested crop. It supports rural employment, tax receipts and export revenue in producing countries, while its health consequences create a compelling case for livelihood diversification and a carefully managed transition. Zimbabwe illustrates this tension particularly clearly. The country is Africa's largest tobacco producer, and smallholders supply most of the crop. The post-2000 expansion of smallholder production widened access to a high-value export chain, but also increased farmers' exposure to concentrated buying, costly inputs, climatic shocks and merchant credit (Scoones et al., 2018; Chingosho et al., 2021; Ruckert et al., 2022). The analytical question is therefore not simply whether tobacco production has grown, but whether producers retain enough value to improve their lives.

Conventional agricultural market theory treats prices as signals that coordinate supply, demand and quality. Competitive auctions should reward better leaf and disclose market conditions, while contracts should



overcome failures in credit, input and extension markets. In practice, smallholders rarely enter tobacco markets on equal terms. Buyers possess superior information, specialised grading knowledge and access to export markets; farmers often face urgent cash needs and cannot credibly withhold produce. Contracts may consequently solve one market failure while creating another: the financier becomes input supplier, technical adviser, creditor and buyer, and can influence several components of the farmer's final settlement (Bellemare and Bloem, 2018; Ruckert et al., 2022).

This institutional structure matters because gross sales are an incomplete measure of welfare. Tobacco is input-intensive. Fertiliser, chemicals, labour, fuel, transport and curing energy must be paid before a household can allocate income to food, health, education, savings or productive assets. A farmer may deliver more leaf and receive a larger gross cheque, yet end the season with lower disposable income if unit costs, debt recoveries and marketing deductions rise faster than the sales price. Debt evidence from Zimbabwe reinforces this concern: Chingosho et al. (2021) found that more than half of surveyed tobacco farmers reported tobacco-related debt, illustrating how continued production can coexist with financial vulnerability.

Makonde District in Mashonaland West Province provides a strategically important setting in which to investigate this contradiction. It is integrated into Zimbabwe's tobacco economy and contains experienced smallholder producers using both auction and contract channels. Farmers' exposure to price uncertainty, input inflation and merchant settlement practices makes the district suitable for analysing the relationship between market governance and household outcomes. Nevertheless, much public discussion remains dominated by national production, delivery and export figures. Such indicators obscure variation in costs, net returns and welfare at farm level.

The study addresses this gap by examining the joint associations of pricing mechanisms, merchant-sponsored financing and production costs with farmer welfare. It asks: (1) how do farmers assess the adequacy and transparency of tobacco pricing; (2) what benefits and burdens arise from merchant finance; (3) how are production costs associated with perceived household welfare; and (4) what is the combined statistical contribution of these factors?

The article makes three contributions. Empirically, it provides district-level mixed-methods evidence while clearly delimiting its transferability. Methodologically, it makes the construction and evidentiary status of the multidimensional welfare index explicit. Theoretically, it combines transaction-cost, agricultural-household and global-value-chain reasoning to explain the production-welfare paradox. For policy, it shifts attention from gross output to sustainable net value retained by producers.

LITERATURE REVIEW

Price formation and smallholder market power

Agricultural prices transmit information about scarcity, quality and consumer demand, but the institutional conditions under which they are formed determine whose information and interests prevail. In a genuinely competitive auction, several independent buyers bid against one another, grading rules are stable, farmers observe transactions and complaints are resolved impartially. These conditions reduce search costs and permit quality-based price discovery. Where buyer concentration is high, however, competition can be more apparent than real. Farmers' perishable or time-bound produce, transport commitments and immediate debt obligations weaken their reservation position, while buyers can compare large volumes and coordinate procurement strategies across markets.

Tobacco grading deepens information asymmetry because price depends on attributes that require specialised judgement. Leaf colour, body, texture, length and curing quality influence classification, yet a farmer may lack the technical knowledge or independent evidence required to challenge a grade. Price volatility therefore has two dimensions: movement between seasons or sales days, and uncertainty within the grading and bidding process. The latter is a governance problem rather than an unavoidable market fluctuation. Transparent grade definitions, visible sales data and a credible appeals system can reduce it; opaque procedures transfer risk to the producer.



International demand and exchange-rate movements also affect tobacco prices, but these macro-level influences do not remove the regulator's responsibility for procedural fairness. Zimbabwe's dual system of auction and contract sales can theoretically offer alternatives. In reality, a contracted farmer's marketing choice is constrained by the obligation to sell through the sponsor so that advances can be recovered. The meaningful welfare outcome is therefore not the headline price per kilogram alone, but the net settlement after rejected leaf, levies, transport, loan recovery, interest and other deductions.

Merchant-sponsored contract farming

Contract farming coordinates production and marketing through a prior agreement between a producer and a buyer. Its strongest justification in smallholder agriculture is that it supplies otherwise inaccessible inputs, working capital, technical advice and a guaranteed outlet. Evidence across developing-country agriculture suggests that contracts can raise participation in high-value markets, but causal welfare conclusions remain sensitive to farmer selection, contract design and the outcome measured (Bellemare and Bloem, 2018). In Zimbabwean tobacco, contracts have supported productivity and expanded smallholder participation; recent evidence estimates a substantial productivity advantage among participating farmers (Pangapanga-Phiri et al., 2024).

Productivity, however, is not equivalent to welfare. The contract determines the price of financed inputs, the interest or service charges, quality obligations, delivery channel, deductions and dispute procedures. When these terms are complex or disclosed late, the farmer cannot compare the effective cost of finance with alternatives. Tied credit also restricts exit: a farmer who disputes grading or pricing may still have to deliver to the sponsor. Transaction-specific investments in tobacco barns, curing skills and specialised inputs further raise switching costs. Merchant finance can thus be simultaneously enabling and disciplinary.

The welfare record is accordingly mixed. Studies in Zimbabwe report benefits for input access, income and asset accumulation, but also debt, dependency and unequal power (Scoones et al., 2018; Shiringo, Chundu and Sithole, 2022; Chingosho et al., 2021). These are not contradictory findings. They indicate that contracts expand the production frontier while distributing risk and value unevenly. A robust assessment must separate gross productive benefits from net financial outcomes and must evaluate whether contract governance allows producers to convert output into durable household capabilities.

Production costs, profitability and welfare

Farm profitability is the residual between revenue and the full economic cost of production. Tobacco requires repeated fertiliser and chemical applications, skilled labour, fuel, transport and energy for curing. Input-price inflation, exchange-rate instability and climate variability can therefore compress margins even when yields remain high. Smallholders are particularly exposed because they buy in small quantities, possess limited storage and bargaining capacity, and frequently obtain inputs on credit. If contract input prices include financing and administrative margins that are not clearly itemised, farmers cannot assess the real cost of the package.

The household consequences extend beyond the farm enterprise. Agricultural households jointly decide production, consumption and labour allocation; shocks to production costs reduce resources available for food, school fees, health care, housing, savings and investment (Singh, Squire and Strauss, 1986). Families may respond by using unpaid household labour, reducing consumption, selling assets or borrowing into the next season. These coping strategies can preserve current production while eroding longer-term resilience. A welfare analysis should consequently include income adequacy, social consumption, assets and financial stability, rather than relying on sales revenue.

Tobacco also creates transition risk. Because farmers have invested in barns, agronomic knowledge and buyer relationships, rapid withdrawal from the crop may destroy livelihoods without creating alternatives. The policy implication is not to entrench tobacco dependency, but to improve fairness in the existing chain while expanding viable diversification. Welfare-enhancing reform must therefore combine immediate protection of net farmer returns with investment in alternative crops, irrigation, value addition and rural finance consistent

with public-health obligations.

Value-chain governance and empirical gap

Global Value Chain governance explains how lead firms coordinate standards, knowledge and transactions across dispersed production networks (Gereffi, Humphrey and Sturgeon, 2005). Coordination can improve traceability and quality, but it also gives powerful firms leverage over suppliers. In tobacco, merchants influence production specifications, extension, input packages, grading and market access. When regulatory information and farmer organisation are weak, the lead firm can capture a disproportionate share of value even without breaching the formal contract.

Zimbabwean research has documented the transformation of tobacco after land reform, the productivity contribution of contracts and the prevalence of debt (Scoones et al., 2018; Chingosho et al., 2021; Pangapanga-Phiri et al., 2024). Less evidence integrates pricing perceptions, contract finance, production costs and multidimensional welfare in one district-level model. The present study fills that analytical gap. Its core proposition is that merchant finance has a conditional welfare effect: access to inputs can improve production, but the benefit reaching the household depends on price adequacy, contract transparency and cost recovery. Production and welfare can therefore move in different directions.

Comparative evidence from Southern Africa

The Zimbabwean experience forms part of a broader Southern African pattern in which tobacco contracts substitute for shallow rural credit and input markets. Malawi, Zambia, Mozambique and Tanzania have used varying combinations of contract production, auction marketing and buyer licensing. Across these systems, the recurring benefit is coordination: merchants provide inputs and technical specifications before production and recover advances when leaf is sold. The recurring risk is concentration: a limited group of buyers controls specialised knowledge, export connections and quality assessment. Differences in national regulation change the form of the problem, but not the underlying tension between assured market access and producer bargaining power.

Malawi's long experience with auction tobacco demonstrates that an auction label does not itself guarantee competitive price formation. When the number of effective buyers is small and growers have already incurred transport and handling costs, rejecting a low bid is costly. Zambia's more contract-oriented chain illustrates the opposite institutional form but a similar distributional concern: input and market access improve, while tied delivery and debt recovery can narrow farmers' choices. Mozambique's smaller and geographically concentrated tobacco economy further shows how a lead firm can become a quasi-governance institution in remote areas by supplying services that the state and financial sector do not provide.

These comparisons caution against a false choice between auctions and contracts. Either mechanism can produce acceptable outcomes when competition, information and enforcement are credible, and either can disadvantage farmers when these conditions are absent. The relevant governance tests are whether farmers know the full cost of finance before planting, whether grading is verifiable, whether several realistic marketing or credit alternatives exist, and whether disputes can be resolved without retaliation or prohibitive delay. Zimbabwe's policy challenge is therefore to make coordination contestable: merchants may integrate finance and buying, but farmers should be able to compare packages, verify deductions and appeal grades.

The regional evidence also strengthens the case for measuring household welfare rather than national export receipts. Tobacco earnings can improve a country's balance of payments while individual growers remain indebted or food insecure. Foreign-currency generation and household development operate at different levels and can diverge when exchange arrangements, input imports and buyer power affect the producer's share. A SADC-oriented research agenda should standardise indicators of cost per kilogram, net margin, debt rollover, unpaid family labour and household capabilities. Comparable evidence would allow regulators to distinguish productive contract support from value extraction and to learn from reforms across neighbouring systems.

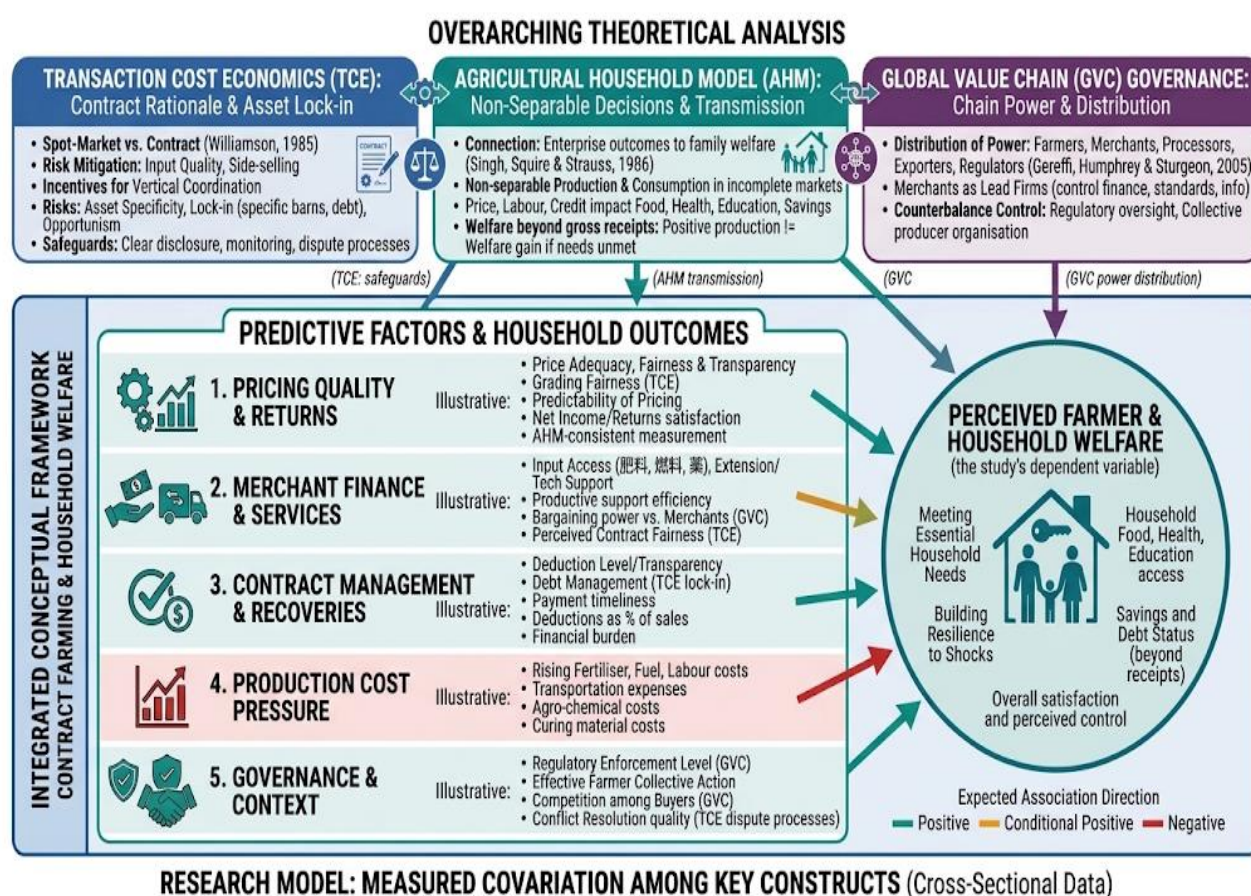
THEORETICAL AND CONCEPTUAL FRAMEWORK

Transaction Cost Economics (TCE) explains why farmers and merchants replace spot-market transactions with contracts. Credit constraints, uncertain input quality, costly market searches and the risk of side-selling create incentives for vertical coordination (Williamson, 1985). Yet the same asset specificity that makes contracts useful can produce lock-in. Tobacco-specific barns, knowledge and debt obligations reduce farmers' capacity to change crops, financiers or buyers. TCE therefore predicts both efficiency gains and risks of opportunism. Clear disclosure, monitoring and enforceable dispute processes become essential safeguards.

The Agricultural Household Model (AHM) connects enterprise outcomes to family welfare. In incomplete markets, production and consumption decisions are non-separable: the price received, household labour used and cost of credit directly affect food, health, education and savings (Singh, Squire and Strauss, 1986). This study applies the AHM by measuring welfare beyond gross tobacco receipts. A positive production effect cannot be classified as a welfare gain if recoveries and operating costs leave the household unable to meet essential needs or build resilience.

Global Value Chain (GVC) governance theory locates these household outcomes within the distribution of power between farmers, merchants, processors, exporters and regulators (Gereffi, Humphrey and Sturgeon, 2005). Merchants' control of finance, standards and market information gives them a lead-firm role. Regulatory oversight and collective producer organisation can counterbalance that control. The three theories are complementary: TCE explains the contract, AHM explains transmission to the household, and GVC theory explains how chain-level power shapes prices and deductions.

Figure 3.1 Conceptual framework



The conceptual model treats perceived farmer welfare as the dependent variable and pricing mechanisms, merchant finance and production-cost pressure as predictors. Pricing quality encompasses adequacy, transparency, predictability, grading fairness and satisfaction with returns. Merchant finance includes input and



extension access, productive support, perceived contract fairness, bargaining power and deductions. Costs include fertiliser, labour, fuel, transport, agrochemicals and curing. The expected associations are positive for fair pricing, conditionally positive for well-governed finance and negative for rising costs. Regulation,

competition and farmer bargaining capacity are interpreted as contextual mechanisms. Because all quantitative constructs were measured at one point in time, the model tests covariation rather than temporal or causal effects.

METHODOLOGY

Design, setting, population and sampling

The study adopted pragmatism because the research problem required numerical estimation and contextual explanation. A cross-sectional mixed-methods design combined a structured farmer survey with key-informant interviews. Makonde District was selected as an analytically relevant tobacco-producing setting containing experienced smallholders using both auction and contract channels. The target population comprised registered tobacco farmers in the district. A planned sample of 296 was selected from the available farmer frame through probability-based procedures that covered the main tobacco-growing areas. Of the questionnaires distributed, 281 usable responses were returned, producing a 94.9% response rate. Ten purposively selected informants from the Tobacco Industry and Marketing Board (TIMB), agricultural extension services and licensed tobacco merchants supplied institutional perspectives. The sampling frame supports inference to registered farmers represented in Makonde; it was not designed to estimate national or Southern African parameters.

The design captured farmers with varied experience and marketing arrangements. Men constituted 61.9% of respondents and women 38.1%. The modal age group was 41-50 years (31.7%), while 85.1% had at least five years of tobacco-growing experience. Secondary education was the most common qualification (40.6%). These characteristics supported informed assessments of seasonal costs, pricing and contract settlement. They do not, however, remove coverage limitations arising from the exclusion of unregistered growers or the district's specific agro-ecological, market and contract conditions. The gender distribution also reflects unequal access to land, finance and registration and cautions against treating the sample as socially neutral.

Operationalisation and validation of farmer welfare

Farmer welfare was defined as the household's perceived capacity to convert tobacco earnings into current needs, human development, material security and resilience after production costs and marketing deductions. This definition follows the Agricultural Household Model's non-separability of production and consumption and the capability view that welfare extends beyond income alone (Singh, Squire and Strauss, 1986; Sen, 1999; Alkire and Foster, 2011). Nine positively oriented items were rated from 1 (strongly disagree) to 5 (strongly agree) and averaged with equal weight. A higher score therefore represented better perceived welfare; 3 was the scale midpoint, and positive responses were ratings of 4 or 5. The separate livelihood-dependence item was not included in the welfare composite because dependence is exposure to a crop, not a welfare achievement.

Table 1. Operationalisation of the perceived farmer-welfare index

Domain	Survey indicator represented in the index	Interpretive meaning
Income adequacy	Tobacco earnings adequately meet household needs after costs and deductions	Current command over resources
Food security	Tobacco income supports regular access to adequate food	Consumption security
Education	Returns enable payment of children's education costs	Human-capital capability
Health care	Returns improve access to needed health care	Health capability



Housing	Returns support housing maintenance or improvement	Living-standard security
Assets	Returns enable acquisition or retention of productive and household assets	Material base and future earning capacity
Savings	Tobacco enables regular household saving	Capacity to defer consumption
Financial resilience	The household can meet obligations and absorb shocks without distress responses	Ability to cope with seasonal risk
Market satisfaction	Satisfaction with final net returns after deductions and costs	Perceived reward from market participation

Note: All nine items were coded 1-5 and combined as an unweighted mean. The index measures perceived welfare; it is not an income, poverty or food-security prevalence statistic. Source: Study questionnaire.

Predictor measurement, analysis and mixed-methods integration

The pricing index combined price adequacy, transparency, predictability, grading fairness and satisfaction with returns. Merchant finance captured access to inputs and extension, productive support, contract fairness, bargaining power and post-sale deductions. Production-cost pressure covered fertiliser, labour, fuel, transport, agrochemicals and curing. The questionnaire also recorded demographic and production characteristics, while the interview guide explored grading, price formation, contract disclosure, cost recovery, disputes and feasible reforms. Content validity was addressed by mapping items to the study objectives and theoretical domains, reviewing the instrument before field administration and piloting it outside the final sample to improve relevance, clarity and sequence. Qualitative convergence strengthened interpretive credibility. Because verified income, asset, food-security and debt records were not collected, the study does not claim criterion validation of the welfare index against objective living-standard measures.

Quantitative data were screened and analysed using frequencies, percentages, means and standard deviations. Pearson's correlation assessed bivariate associations, and ordinary least-squares multiple regression estimated the joint statistical association of the three predictors with perceived welfare. Statistical significance was evaluated at the 5% level and variance inflation factors were inspected for multicollinearity. Coefficients are interpreted as conditional associations within this sample, not estimates of causal effects. Interview material was coded thematically and compared with statistical patterns; integration occurred during interpretation, especially to explain why finance that supported production showed a weaker welfare association than pricing and costs. Participation was voluntary, respondents received study information, and confidentiality was protected. No individual farmer, official or merchant is identified.

RESULTS

Costs, pricing, finance and welfare

The dominant finding was cost escalation. The production-cost index recorded a mean of 4.50 (SD = .69), with 90.8% positive responses. Fertiliser was the largest estimated cost component (28.6%), followed by labour (22.3%), fuel and transport (18.5%), agrochemicals (15.2%) and curing (10.8%). Ninety-six per cent of respondents agreed that rising costs reduced net profit, and 94.0% linked costs to household financial pressure. The pattern is consistent with respondents experiencing cost inflation that was not offset by perceived productivity gains or selling prices and was associated with lower disposable income.

Pricing received the weakest assessment. The composite mean was 2.21 (SD = .85), and only 29.0% of responses were positive. The lowest-rated statement was that prices adequately covered production costs (mean = 1.96). Perceived transparency and predictability were also low (2.34), as were satisfaction with final returns (2.11). Farmers nevertheless recognised that grade and quality (4.63), international demand (4.49) and exchange-rate movement (4.28) influenced prices. The tension is important: respondents understood legitimate market drivers but did not believe that the procedures translating those drivers into farm-gate returns were sufficiently transparent or adequate.



Merchant financing produced a dual result. Farmers strongly credited it with improving productivity (4.47), input access (4.41) and extension access (4.22), yielding a composite benefit score of 3.97. Yet only 46.9% agreed that merchant finance improved household income. Contract governance scored 2.56: bargaining power was especially weak (2.08), input charges were viewed as unreasonable (2.18), and contract fairness scored 2.24. Post-sale deductions were widely viewed as reducing net income (4.52); transparency of deductions scored only 2.31. Finance thus succeeded as a production mechanism more clearly than as a welfare mechanism.

Perceived welfare scores confirmed the gap between livelihood dependence and reported household benefit. The overall welfare index was 2.86 (SD = .81), below the scale midpoint of 3. Household income scored 2.68, social welfare 2.62, financial resilience 2.47 and market satisfaction 2.23. By contrast, the separate livelihood-dependence score was 4.29. Only 33.8% reported that tobacco enabled regular saving, 43.8% linked it to improved health-care access and 51.6% said it adequately supported children's education. These values show how respondents assessed their circumstances; they do not constitute verified income, poverty or food-security rates. The crop remained economically important, but perceived reliance on it exceeded its reported capacity to deliver secure welfare.

Table 2. Consolidated descriptive findings (n = 281)

Construct/indicator	Mean	SD	Positive responses (%)	Interpretation
Rising production costs	4.5	0.69	90.8	Severe cost pressure
Fair and adequate pricing	2.21	0.85	29	Weak pricing outcome
Merchant-finance production benefits	3.97	0.74	79.4	Strong production-access benefit
Contract fairness and bargaining	2.56	0.87	40.9	Weak governance
Post-sale deduction pressure	3.32	0.77	61.9	Material erosion of returns
Household income welfare	2.68	0.82	48.8	Low
Social welfare	2.62	0.81	51.5	Low to moderate
Overall welfare index	2.86	0.81	-	Below neutral midpoint
Livelihood dependence on tobacco	4.29	0.71	88.3	Very high dependence

Source: Field survey.

Associations and multivariate model

All three explanatory variables were significantly associated with welfare. Better pricing mechanisms had the strongest positive correlation ($r = .732$, $p < .001$), while merchant finance showed a moderate positive association ($r = .491$, $p < .001$). Production costs were strongly and negatively associated with welfare ($r = -.684$, $p < .001$). The relationships among predictors were moderate or lower, suggesting that they captured related but distinct aspects of the marketing system.

Table 3. Pearson correlations

Variable	Pricing	Merchant finance	Production costs	Farmer welfare
Pricing mechanisms	1			
Merchant finance	.418**	1		
Production costs	-.536**	-.381**	1	
Farmer welfare	.732**	.491**	-.684**	1

Note: ** $p < .01$ (two-tailed). Source: Field survey.



The reported regression model was statistically significant, $F(3,277) = 244.219$, $p < .001$, and accounted for 71.4% of variation in perceived welfare within the sample (adjusted $R^2 = .709$). Pricing had the largest positive standardised coefficient ($\beta = .512$), followed by merchant finance ($\beta = .192$), while production costs had a substantial negative coefficient ($\beta = -.417$). Variance inflation factors ranged from 1.30 to 1.40, providing no indication of problematic multicollinearity. These estimates describe conditional associations and should not be read as causal effects.

Table 4. Multiple regression predicting perceived farmer welfare

Predictor	B	Standardised beta	t	p	VIF
Constant	0.781	-	3.864	<.001	-
Pricing mechanisms	0.486	0.512	10.943	<.001	1.4
Merchant finance	0.168	0.192	4.283	<.001	1.3
Production costs	-0.394	-0.417	-9.487	<.001	1.35

Model summary: $R = .845$; $R^2 = .714$; adjusted $R^2 = .709$; standard error = .392. Source: Field survey.

Interview themes converged with the survey. Informants described merchant finance as indispensable for farmers excluded from conventional credit, but noted that the bundled nature of inputs, extension, purchasing and debt recovery made it difficult for producers to isolate the cost of each service. Farmers' concern centred less on repayment itself than on limited prior disclosure and the inability to verify final deductions. Informants also identified grading consistency, late or incomplete price information and weak complaint resolution as recurring sources of mistrust. These accounts help interpret the modest positive regression coefficient for finance: the package enables production, while informants and farmers reported governance weaknesses that restrict income reaching households.

Table 5. Integrated qualitative themes

Theme	Convergent finding	Welfare implication
Input access	Contracts make seed, fertiliser, chemicals and advice available	Supports production and market participation
Tied dependency	Sponsor is simultaneously creditor, adviser and buyer	Restricts exit and bargaining power
Settlement opacity	Farmers cannot easily verify input prices, interest and deductions	Reduces trust and disposable income
Grading and price information	Standards and market signals are not consistently understood before sale	Increases price uncertainty
Cost escalation	Fertiliser, labour, transport and curing costs rise faster than returns	Weakens savings and household resilience
Complaint resolution	Existing channels are perceived as slow or inaccessible	Reinforces unequal chain governance

Source: Key-informant interviews and survey integration.

DISCUSSION

The production-welfare paradox

The results reveal a production-welfare paradox. Merchant finance relaxes perceived liquidity constraints, supplies inputs and supports production, yet the overall welfare index remains below the neutral midpoint. This finding refines simple claims that contract farming either benefits or exploits farmers. Both productive support and welfare vulnerability can coexist within the same arrangement. Contracts generate gross productive value, but costs, recoveries and pricing influence how much value remains with the household. The

positive but comparatively small regression coefficient for merchant finance is consistent with this conditional interpretation, although the cross-sectional design cannot establish the direction or timing of the relationship.

This interpretation aligns with Bellemare and Bloem's (2018) warning that contract-farming welfare estimates depend on research design and the outcomes selected. It also helps reconcile Zimbabwean evidence reporting productivity and development benefits (Shiringo, Chundu and Sithole, 2022; Pangapanga-Phiri et al., 2024) with evidence of debt and unequal relations (Scoones et al., 2018; Chingosho et al., 2021). A production indicator captures access and yield; a welfare indicator captures value retained and converted into capabilities. Policy assessment should report both.

TCE explains why the arrangement persists despite dissatisfaction. Farmers need timely inputs and a guaranteed outlet, and merchants need quality-controlled supply and protection against default. A contract reduces coordination costs for both. However, farmers' tobacco-specific assets and debt increase switching costs, while information asymmetry permits opportunistic pricing or, at minimum, creates perceptions of unfairness. The answer is not the removal of coordination but better contractual institutions: standard disclosure, comparable effective credit costs, independent verification and enforceable appeals.

Pricing and value distribution

Pricing showed the strongest positive association with perceived welfare. This is economically intuitive because price contributes to gross revenue, but the magnitude of the association also signals a possible governance deficit. Farmers did not reject the relevance of quality or international demand; they questioned whether grading, bidding and settlement fairly translated those factors into returns. Publishing an average daily price is insufficient if farmers cannot compare prices by grade, buyer, floor and marketing channel or understand how their own bale was classified.

GVC theory places this finding within the chain's power structure. Merchants and exporters possess market intelligence, capital and control over standards, while individual farmers sell small volumes and face immediate repayment obligations. The asymmetry can shift value downstream even where formal market rules exist. Stronger TIMB oversight, interoperable digital sales records and farmer access to historical grade-price data would reduce information rents. An independent re-grading or rapid appeal mechanism would make procedural fairness observable rather than aspirational.

Price stabilisation must nevertheless be approached carefully. Administratively fixed prices can suppress demand or distort quality incentives if detached from export conditions. A more credible approach is a transparent cost-and-market reference framework. Before the season, regulators and producer bodies could publish indicative enterprise budgets and the exchange-rate, input-cost and international-demand assumptions underlying them. During sales, real-time grade-level information could permit benchmarking. Such measures would not eliminate volatility, but would distinguish legitimate market movement from opaque price formation.

Costs, debt and household capability

Production-cost pressure had the second-largest standardised coefficient in absolute magnitude and the expected negative association with perceived welfare. Fertiliser, labour, fuel, transport and curing together dominate tobacco expenditure, and respondents reported that increases reduced profit, savings and investment. The Agricultural Household Model explains the plausible transmission mechanism: when enterprise costs rise, the same household budget finances production and consumption. Families may protect the crop by sacrificing food diversity, health expenditure or school payments, making production continuity a potentially misleading sign of resilience. Longitudinal records are needed to test this pathway directly.

The combination of high dependence and low welfare is particularly concerning. Tobacco may remain the household's best available cash enterprise even when returns are inadequate. This is a constrained choice, not evidence that the marketing system is satisfactory. Debt can deepen the constraint by committing future harvests and limiting diversification. Chingosho et al.'s (2021) finding of widespread tobacco-related debt



provides external support for interpreting finance as both access and vulnerability.

Cost policy should avoid undifferentiated subsidies that are fiscally costly and vulnerable to capture. More durable measures include bulk procurement through transparent farmer organisations, competitive local input supply, energy-efficient curing, extension on input optimisation, shared transport and seasonal credit priced independently of the buyer. Digital farm records can help farmers calculate cost per kilogram and compare contract packages. Such interventions strengthen management capacity while preserving farmers' agency.

Gender, sustainability and transition

The underrepresentation of women among registered respondents requires policy attention. Contract eligibility commonly depends on land access, collateral, registration and control of productive assets, areas in which women may face structural disadvantage. Even when women provide substantial farm labour, the registered producer may control sales and income. Contract and welfare monitoring should therefore disaggregate access, labour, payment and decision-making by sex rather than treating the registered grower as equivalent to the entire household.

The results also have environmental and public-health implications. Curing can contribute to woodland pressure, and tobacco-dependent households face long-term demand and regulatory uncertainty associated with global tobacco control. Improving current farmer returns should not be confused with promoting indefinite crop expansion. A just transition requires sequencing: prevent unfair extraction in the existing chain, then use stronger retained income, extension systems and rural finance to support diversification into viable alternatives. Abrupt withdrawal of contract support without substitute markets would transfer transition costs to already vulnerable households.

CONCLUSIONS AND POLICY IMPLICATIONS

This study concludes that perceived farmer welfare in Makonde is more closely associated with net value retained after pricing, costs and contract settlement than with production volume alone. Merchant finance performs an important productive function, but its welfare contribution is constrained by tied marketing, weak bargaining power and opaque deductions. Pricing quality has the strongest positive association with welfare, while escalating costs have a large negative association. The three factors jointly account for a substantial share of sample variation, but the cross-sectional model does not establish causal effects. Tobacco policy should therefore supplement delivery and export indicators with transparent measures of net farm returns and multidimensional household outcomes.

Five policy actions follow. First, TIMB should publish real-time, grade-specific prices by floor, buyer and marketing channel in formats accessible by mobile phone and local notice points. Digital bale records should show grade, bid history, rejection reason and final price. Second, all contracts should use a standard disclosure sheet stating the cash price of each input, effective financing charge, repayment basis, deductions, dispute route and consequences of crop failure. Farmers should receive the document in plain language before accepting inputs.

Third, settlement statements should be independently auditable. Every deduction should carry a code, contractual basis and opening balance, and farmers should have access to a time-bound appeal or re-grading process outside the purchasing merchant. Fourth, government, banks and development-finance institutions should expand seasonal credit that is not tied to a single buyer. Competition in finance would allow producers to compare packages and preserve marketing choice. Producer cooperatives can complement this reform through bulk input procurement, shared transport, independent extension and collective negotiation.

Fifth, cost reduction and diversification should be integrated. Energy-efficient curing, soil testing, optimised fertiliser use and transparent local input markets can improve margins in the short term. In parallel, irrigation, market development and finance for alternative high-value crops should reduce long-term tobacco dependence. These measures should include women as contract holders and decision-makers, with sex-disaggregated monitoring of finance, labour, payments and welfare.

The study's contribution is to recast tobacco performance as a distributional question. A chain is not inclusive because farmers are numerous or output is high; it is inclusive when producers can understand transactions, exercise meaningful choice, retain a fair return and convert that return into food security, education, health, assets and resilience. For Makonde and Zimbabwe more broadly, the appropriate policy metric is therefore sustainable net household benefit, not kilograms delivered alone.

LIMITATIONS AND FUTURE RESEARCH

Four limitations delimit the evidence. First, the cross-sectional design cannot establish temporal order, rule out reverse causality or show how the same households respond across good and bad production seasons. Second, predictor and welfare measures were largely self-reported in one questionnaire, leaving the estimates vulnerable to recall, social-desirability and common-method bias. Third, the welfare index captures perceptions across nine relevant domains but was not validated against verified household income, consumption, asset, food-security, debt or net-margin records; a below-midpoint score is therefore not an objective poverty classification. Fourth, the sample concerns registered farmers in one district. Makonde's agro-ecology, buyer composition and contract arrangements may differ from those in other tobacco-producing districts, limiting statistical generalisation to Zimbabwe or Southern Africa. Omitted factors such as farm size, yield, irrigation, contract type, household composition and climatic exposure may also influence the reported associations.

Future research should use a multi-district panel that follows contracted, auction and self-financed farmers for at least three production seasons. A stratified design spanning major tobacco-growing districts should compare agro-ecological zones, marketing channels, farm scales and women- and men-managed farms. Repeated interviews should be linked to contract documents, input invoices, bale-level grades and prices, settlement statements and opening and closing debt balances. Household outcomes should combine perceived welfare with net farm and total household income, consumption expenditure, asset ownership and change, food security, school and health expenditure, savings, distress borrowing and debt-service burdens. The World Bank's LSMS-ISA model demonstrates the value of multi-topic agricultural household panels, while FAO's Food Insecurity Experience Scale offers a standardised measure of experienced food-access constraints (World Bank, n.d.; FAO, n.d.). Linking these objective and standardised measures to the present perception items would permit convergent and criterion validation. Fixed-effects models could control for time-invariant household heterogeneity; where a pricing, grading or credit reform is introduced at different times or places, difference-in-differences or another defensible quasi-experimental design could strengthen causal inference.

Table 6. Recommended multi-season evidence and validation protocol

Evidence domain	Objective or standardised measure	Analytical contribution
Farm returns	Bale-level price and grade, verified yield, input invoices, labour and curing costs, net margin/kg	Separates gross production from value retained
Household resources	Farm and non-farm income, consumption expenditure, savings and liquid balances	Tests income adequacy and consumption smoothing
Assets and debt	Asset inventory and change, opening/closing debt, interest, rollover and debt-service ratio	Measures accumulation, depletion and financial vulnerability
Food and human development	FAO FIES; school and health expenditure; missed schooling or foregone care	Validates food, education and health perceptions



Market governance	Contract terms, effective finance cost, deductions, complaint and re-grading outcomes	Links governance mechanisms to net settlement
Panel structure	Same households across at least three seasons and several districts	Establishes temporal order and improves external validity

Note: These measures are proposed for follow-up validation and were not retrospectively added to the current dataset.

DECLARATIONS

Ethics: Participation was voluntary and confidentiality was maintained.

Funding: No external funding is declared.

Conflict of interest: The authors declare no conflict of interest.

Data availability: An anonymised dataset may be made available by the authors subject to ethical and institutional requirements.

Author contributions: The authors jointly conceptualised the study, conducted the analysis and prepared the manuscript.

REFERENCES

1. Alkire, S. and Foster, J. (2011) 'Counting and multidimensional poverty measurement', *Journal of Public Economics*, 95(7-8), pp. 476-487. <https://doi.org/10.1016/j.jpubeco.2010.11.006>.
2. Bellemare, M.F. and Bloem, J.R. (2018) 'Does contract farming improve welfare? A review', *World Development*, 112, pp. 259-271. <https://doi.org/10.1016/j.worlddev.2018.08.018>.
3. Chingosho, R., Dare, C. and van Walbeek, C. (2021) 'Tobacco farming and current debt status among smallholder farmers in Manicaland province in Zimbabwe', *Tobacco Control*, 30(6), pp. 610-615. <https://doi.org/10.1136/tobaccocontrol-2019-055342>.
4. Food and Agriculture Organization (FAO) (2023) *The State of Food and Agriculture 2023: Revealing the True Cost of Food to Transform Agrifood Systems*. Rome: FAO. <https://doi.org/10.4060/cc7724en>.
5. Food and Agriculture Organization (FAO) (2024) *FAOSTAT: Crops and Livestock Products*. Rome: FAO. Available at: <https://www.fao.org/faostat/> (Accessed: 25 July 2026).
6. Food and Agriculture Organization (FAO) (n.d.) About the Food Insecurity Experience Scale (FIES). Available at: <https://www.fao.org/measuring-hunger/access-to-food/about-the-food-insecurity-experience-scale-%28fies%29/en> (Accessed: 24 August 2026).
7. Gereffi, G., Humphrey, J. and Sturgeon, T. (2005) 'The governance of global value chains', *Review of International Political Economy*, 12(1), pp. 78-104. <https://doi.org/10.1080/09692290500049805>.
8. Pangapanga-Phiri, I., Mungatana, E. and Mhondoro, G. (2024) 'Does contract farming arrangement improve smallholder tobacco productivity? Evidence from Zimbabwe', *Heliyon*, 10, e23862. <https://doi.org/10.1016/j.heliyon.2023.e23862>.
9. Ruckert, A., Ciurlia, D., Labonté, R., Lencucha, R., Drope, J., Nhamo, N., Kadungure, A. and Mlambo, Z. (2022) *The Political Economy of Tobacco Production and Control in Zimbabwe: A Document Analysis*. Chicago: Tobacconomics, University of Illinois Chicago.
10. Scoones, I., Mavedzenge, B., Murimbarimba, F. and Sukume, C. (2018) 'Tobacco, contract farming, and agrarian change in Zimbabwe', *Journal of Agrarian Change*, 18(1), pp. 22-42. <https://doi.org/10.1111/joac.12210>.
11. Sen, A. (1999) *Development as Freedom*. Oxford: Oxford University Press.
12. Shiringo, L., Chundu, M. and Sithole, P. (2022) 'Contribution of smallholder tobacco contract farming



to economic and human development of rural communities in Zimbabwe: A case of Igava Community, Marondera District', *Open Journal of Social Sciences*, 10, pp. 36-57.

<https://doi.org/10.4236/jss.2022.109004>.

13. Singh, I., Squire, L. and Strauss, J. (eds.) (1986) *Agricultural Household Models: Extensions, Applications and Policy*. Baltimore: Johns Hopkins University Press.
14. Tobacco Industry and Marketing Board (TIMB) (2023) *Annual Report 2023*. Harare: TIMB.
15. Tobacco Industry and Marketing Board (TIMB) (2024) *Strategic Plan 2022-2026: 2024 Review*. Harare: TIMB.
16. Williamson, O.E. (1985) *The Economic Institutions of Capitalism*. New York: Free Press.
17. World Bank (n.d.) Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA). Available at: <https://www.worldbank.org/en/programs/lms/initiatives/lms-ISA> (Accessed: 24 August 2026).