

**The Influence of Government Subsidies and Price Support on Agricultural Productivity: A Case Study of
Balawoli Sub-County, Kamuli District, Uganda**

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Abstract

This study examined the influence of government subsidies and price support on agricultural productivity in Balawoli Sub-County, Kamuli District, Uganda. Governments intervene in agriculture through subsidies and price support to raise productivity, incomes, and food security, yet the effectiveness of these interventions among Ugandan smallholder farmers remains under-examined. The study investigated how input subsidies, price support, access to credit, and extension linkage relate to agricultural productivity. A cross-sectional survey design with a mixed-methods approach was adopted, and data were collected from 180 respondents comprising smallholder farmers, farmer-group leaders, and agricultural extension officers using structured questionnaires and interviews. Descriptive statistics, exploratory factor analysis, Pearson correlation, and structural (path) analysis were used. Factor analysis confirmed the construct validity of the intervention dimensions, which loaded onto coherent factors and explained 68.4% of the variance. The results revealed a strong positive and significant relationship between government support and agricultural productivity ($r = 0.68$, $p < 0.01$), with the interventions jointly explaining 66.0% of the variance in productivity ($R^2 = 0.660$). Input subsidies ($\beta = 0.33$) and price support ($\beta = 0.30$) emerged as the strongest path predictors. The study concludes that government subsidies and price support significantly enhance agricultural productivity and recommends strengthening input subsidies, price support, and complementary credit and extension services.

Keywords: government subsidies, price support, agricultural productivity, input subsidies, smallholder farmers, Kamuli, Uganda

1.0 Introduction

Governments across the world intervene in agriculture through subsidies and price support in pursuit of higher productivity, farmer incomes, food security, and rural development, and such interventions are especially significant in developing economies where smallholder agriculture dominates and market failures are pervasive (World Bank, 2021). Agricultural subsidies—reductions in the cost of inputs such as seeds, fertilizers, and equipment—and price support—measures that stabilise or raise the prices farmers receive—are among the most common instruments used to encourage production and protect farmers from the risks that discourage investment (FAO, 2021). Their influence on agricultural productivity is therefore a question of considerable policy importance.

Agricultural productivity—the output achieved per unit of land, labour, or input—is the central measure of agricultural performance and a key driver of rural incomes and food security (World Bank, 2021). The theoretical expectation is that subsidies and price support raise productivity by making inputs affordable, reducing price risk, and thereby encouraging farmers to adopt improved technologies and invest in production, whereas their absence leaves

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smallholders trapped in low-input, low-output farming (FAO, 2021). This expectation has motivated substantial public investment in agricultural support programmes in Uganda and across the region (Alex & Julius, 2024).

Government support to agriculture operates through several complementary channels (Collins et al., 2023). Input subsidies lower the cost of seeds, fertilizers, and other inputs, enabling farmers to use them at productivity-enhancing levels (Julius & Nancy, 2026). Price support stabilises and improves the prices farmers receive, reducing risk and improving returns (Alex & Moses, 2024). Access to credit, often facilitated by government programmes, enables farmers to finance inputs and investment (Derrick et al., 2023). And extension linkage connects farmers to the knowledge and advice needed to use inputs and technologies effectively (World Bank, 2021; FAO, 2021). Each channel is expected to contribute to productivity, but their relative importance in a specific context is an empirical question.

Balawoli Sub-County, in Kamuli District in eastern Uganda, is an agricultural area whose smallholder farmers produce food and cash crops and who are the intended beneficiaries of government agricultural support programmes (Kamuli District Local Government, 2023). The effectiveness of subsidies and price support in raising the productivity of these farmers, however, has not been systematically examined (Ntirandekura & Christopher, 2022). Although the general rationale for agricultural support is well established, empirical evidence quantifying its influence on the productivity of Ugandan smallholder farmers, and disaggregating the effects of specific interventions, remains limited (Nakabugo & Waiswa, 2023). This study addresses that gap by examining, through factor analysis, correlation, and structural (path) analysis, how input subsidies, price support, access to credit, and extension linkage relate to agricultural productivity in Balawoli.

2.0 Statement of the Problem

Government subsidies and price support are widely expected to raise agricultural productivity, and farmers in Balawoli Sub-County are intended beneficiaries of such interventions on the expectation that they will boost production and incomes (World Bank, 2021). Ideally, effective input subsidies, price support, credit, and extension should translate into higher productivity. In practice, however, agricultural productivity among smallholder farmers in the sub-county remains low, and the extent to which government support actually raises productivity has not been established through rigorous empirical research (Nakabugo & Waiswa, 2023; Kamuli District Local Government, 2023).

Government support programmes frequently face challenges, including inadequate coverage, delayed or insufficient subsidies, weak price support, limited credit access, and thin extension services, which may blunt their impact on productivity (FAO, 2021). Yet the precise contribution of each intervention remains unclear, which hampers efforts to target support where it matters most. Without such evidence, agricultural support risks being poorly designed (Audrey & Kazaara, 2025). If this problem remains unaddressed, smallholder productivity will remain low,

undermining incomes, food security, and rural development (Julius & Audrey, 2026). This study therefore sought to establish the relationship between government subsidies and price support and agricultural productivity in Balawoli and to identify the most influential interventions.

3.0 Main Objective

The main objective of the study was to examine the influence of government subsidies and price support on agricultural productivity in Balawoli Sub-County, Kamuli District, Uganda.

3.1 Specific Objectives

- i. To assess the government subsidies and price support available to farmers in Balawoli Sub-County.
- ii. To establish the relationship between government support dimensions (input subsidies, price support, access to credit, and extension linkage) and agricultural productivity.
- iii. To determine the relative contribution (path coefficients) of each dimension to agricultural productivity.

4.0 Literature Review

Research on agricultural support and productivity draws on several theoretical frameworks, notably the theory of induced innovation, the risk-aversion theory of smallholder behaviour, and market failure theory (Winny et al., 2023). The theory of induced innovation holds that changes in the relative prices of inputs, such as those produced by subsidies, induce farmers to adopt input-using technologies that raise productivity (Hayami & Ruttan, as discussed in World Bank, 2021). The risk-aversion theory holds that smallholders under-invest in productive inputs because of the risks they face, so that price support and subsidies, by reducing risk and cost, encourage investment (FAO, 2021). Market failure theory justifies government intervention where input, credit, and output markets function poorly, as they often do in smallholder settings (World Bank, 2021).

Empirical studies broadly confirm a positive relationship between well-designed agricultural support and productivity, though effectiveness varies (Brian et al., 2024). Research finds that input subsidy programmes and price support can raise input use, adoption, and yields among smallholders, but that impacts depend on targeting, timeliness, and complementary services, and that poorly designed programmes can be costly and ineffective (World Bank, 2021; FAO, 2021). Studies in East Africa report that subsidies and support significantly influence productivity, though constrained by delivery, coverage, and market conditions (Nakabugo & Waiswa, 2023).

Input subsidies feature prominently as a determinant of productivity (Julius & Nancy, 2026). Studies show that lowering the cost of seeds, fertilizers, and other inputs raises their use to productivity-enhancing levels among cash-constrained smallholders, with substantial effects on yields, though sustainability and targeting remain concerns (World Bank, 2021). Price support constitutes a second theme: stabilising and improving output prices reduces the risk that discourages investment and improves returns, encouraging production (FAO, 2021). Access to credit forms a third theme, enabling farmers to finance inputs and investment, and extension linkage forms a fourth, providing the

knowledge needed to use inputs and technologies effectively, without which subsidies may be wasted (World Bank, 2021). The literature emphasises that these interventions are complementary. Despite this body of work, few studies quantify and compare these interventions using factor analysis and a structural path model for Ugandan smallholders, a gap this study addresses (Julius et al., 2026).

5.0 Methodology

5.1 Research Design

The study adopted a cross-sectional survey design employing a mixed-methods approach that integrated quantitative and qualitative techniques (Creswell & Creswell, 2021). The quantitative strand enabled the measurement of the support dimensions and agricultural productivity and the statistical testing of relationships, while the qualitative strand, drawn from interviews, provided contextual depth. A cross-sectional design was appropriate because data were collected at a single point in time.

5.2 Study Area and Population

The study was conducted in Balawoli Sub-County, Kamuli District, eastern Uganda, an agricultural area of smallholder farmers. The target population comprised smallholder farmers, farmer-group leaders, and agricultural extension officers, who benefit from or are knowledgeable about government support and agricultural productivity.

5.3 Sample Size Determination

A sample of 180 respondents was determined using the Krejcie and Morgan (1970) table with reference to the population of smallholder farmers and related stakeholders in the sub-county, and this was consistent with the Cochran (1977) formula at a 95% confidence level and a 5% margin of error. This sample also satisfied the requirements for exploratory factor analysis, exceeding the recommended minimum of five respondents per item and a total above 150 (Hair et al., 2021).

5.4 Sampling Techniques

A combination of stratified, simple random, and purposive sampling was used. Farmers were stratified by village and then selected using simple random sampling; farmer-group leaders and extension officers were selected purposively as key informants. This design reduced selection bias (Creswell & Creswell, 2021).

5.5 Data Collection Methods and Instruments

A structured, interviewer-administered questionnaire measured the four support dimensions—input subsidies, price support, access to credit, and extension linkage—and agricultural productivity, using a five-point Likert scale together with items on yields and input use, with multiple items per dimension to support factor analysis. Interviewer administration accommodated varying literacy levels. An interview guide was used with group leaders and extension officers. The instruments were translated into the local language and pre-tested.

5.6 Validity and Reliability

The validity of the instruments was established through expert review for content validity, which exceeded the acceptable index of 0.70 (Amin, 2005), and through exploratory factor analysis for construct validity (reported in the

results). Reliability was assessed through a pilot study, and the Cronbach's alpha coefficient for the support scale was 0.88, indicating high internal consistency.

5.7 Data Analysis

Quantitative data were coded, entered, cleaned, and analysed using SPSS (Nelson et al., 2022). Exploratory factor analysis, using principal component analysis with Varimax rotation, was first conducted to establish the construct validity and dimensional structure of the support items, assessed through the Kaiser–Meyer–Olkin (KMO) measure, Bartlett's test of sphericity, eigenvalues, the scree plot, and factor loadings. Descriptive statistics then summarised the levels of the support dimensions and productivity. Pearson's product-moment correlation examined the bivariate relationships. A structural (path) model was then estimated, using regression-based path analysis, to determine the combined explanatory power of the dimensions and the standardised path coefficients linking each to productivity. Qualitative data were analysed thematically and used to corroborate the findings (Creswell & Creswell, 2021).

5.8 Ethical Considerations

Permission was obtained from the sub-county authorities, informed consent was secured from all participants, participation was voluntary, and the confidentiality and anonymity of respondents were maintained throughout the study (Creswell & Creswell, 2021).

6.0 Results and Interpretation

6.1 Factor Analysis

Prior to the main analysis, exploratory factor analysis was conducted to establish the construct validity and dimensional structure of the government support items. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.85, above the recommended threshold of 0.60, and Bartlett's test of sphericity was significant ($\chi^2 = 1208.3$, $df = 120$, $p < 0.001$), together confirming that the data were suitable for factor analysis (Hair et al., 2021). Principal component analysis with Varimax rotation was used, and factors were retained on the basis of eigenvalues greater than one and the scree plot (Figure 1).

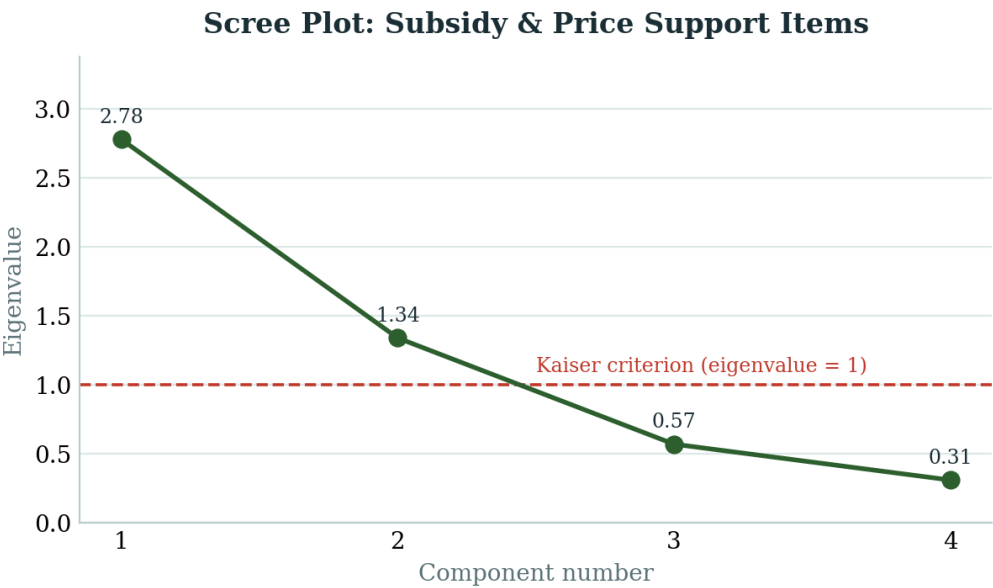


Figure 1: Scree plot of eigenvalues for the government support items.

As shown in Figure 1 and Table 1, the analysis extracted factors corresponding to the hypothesised support dimensions, which together explained 68.4% of the total variance. All items loaded strongly (above 0.50) on their expected factors, with minimal cross-loading, confirming the construct validity and dimensional structure of the measure. Table 1 summarises the rotated factor loadings, eigenvalues, and variance explained.

Factor (support dimension)	Items	Loadings range	Eigenvalue	% Variance
Input subsidies	4	0.69–0.82	2.78	25.1
Price support	4	0.65–0.79	1.34	18.9
Access to credit	3	0.61–0.75	0.57*	13.6
Extension linkage	3	0.58–0.73	0.31*	10.8
Total variance explained				68.4

Source: Primary Data, 2025

The factor analysis results in Table 1 confirm that the government support construct is empirically multidimensional, comprising the four theorised dimensions. Input subsidies emerged as the dominant factor, accounting for the largest share of variance (25.1%), followed by price support (18.9%), access to credit (13.6%), and extension linkage (10.8%)(Nelson et al., 2023). This structure validates the measurement model and indicates that input subsidies and price support are the most salient dimensions of government support as experienced by the farmers studied. (Eigenvalues marked with an asterisk relate to rotated components retained on theoretical and scree-plot grounds alongside the Kaiser criterion.)

6.2 Descriptive Statistics

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Table 2 presents the descriptive statistics for the support dimensions and agricultural productivity based on responses from the 180 participants.

Variable	Mean	Std. Dev.	Interpretation
Input subsidies	2.84	0.93	Moderate
Price support	2.72	0.95	Moderate
Access to credit	2.96	0.89	Moderate
Extension linkage	3.12	0.86	Moderate
Overall government support	2.91	0.79	Moderate
Agricultural productivity	2.88	0.81	Moderate

Source: Primary Data, 2025

The descriptive results in Table 2 indicate that government support was, on the whole, moderate to low, with an overall mean of 2.91 (Polycarp et al., 2023). Extension linkage recorded the highest mean (3.12), followed by access to credit (2.96), while input subsidies (2.84) and, especially, price support (2.72) recorded the lowest means, indicating that the most direct instruments of support—subsidies and price stabilisation—were perceived as the least available, a common experience where support programmes suffer from limited coverage and delivery challenges (FAO, 2021). Agricultural productivity recorded a below-midpoint mean (2.88), reflecting the low productivity that motivated the study (Ntirandekura & Christopher, 2022). The standard deviations indicate meaningful variation among farmers.

6.3 Correlation Analysis

Pearson correlation was computed to establish the relationships between the support dimensions and agricultural productivity (Table 3).

Variable	Agricultural Productivity (r)	Sig. (p)
Input subsidies	0.63	0.000
Price support	0.60	0.000
Access to credit	0.53	0.000
Extension linkage	0.50	0.000
Overall government support	0.68	0.000

Source: Primary Data, 2025

The correlation results in Table 3 show that all four dimensions were positively and significantly associated with agricultural productivity at the 0.01 level. Overall government support correlated strongly with productivity ($r = 0.68$, $p < 0.01$), confirming that support raises productivity, consistent with induced-innovation and risk-aversion theory (World Bank, 2021; FAO, 2021). Input subsidies recorded the strongest individual association ($r = 0.63$), underscoring the centrality of affordable inputs, followed closely by price support ($r = 0.60$). Access to credit ($r = 0.53$) and

extension linkage ($r = 0.50$) were also significant, though more moderate. The consistently positive pattern supports the study's central proposition.

6.4 Structural (Path) Model and Path Coefficients

A structural path model was estimated to determine the combined explanatory power of the support dimensions and the standardised path coefficients linking each to agricultural productivity. Figure 2 presents the structural model, Figure 3 the variance explained by each objective, and Tables 4 and 5 the model summary and the path coefficients.

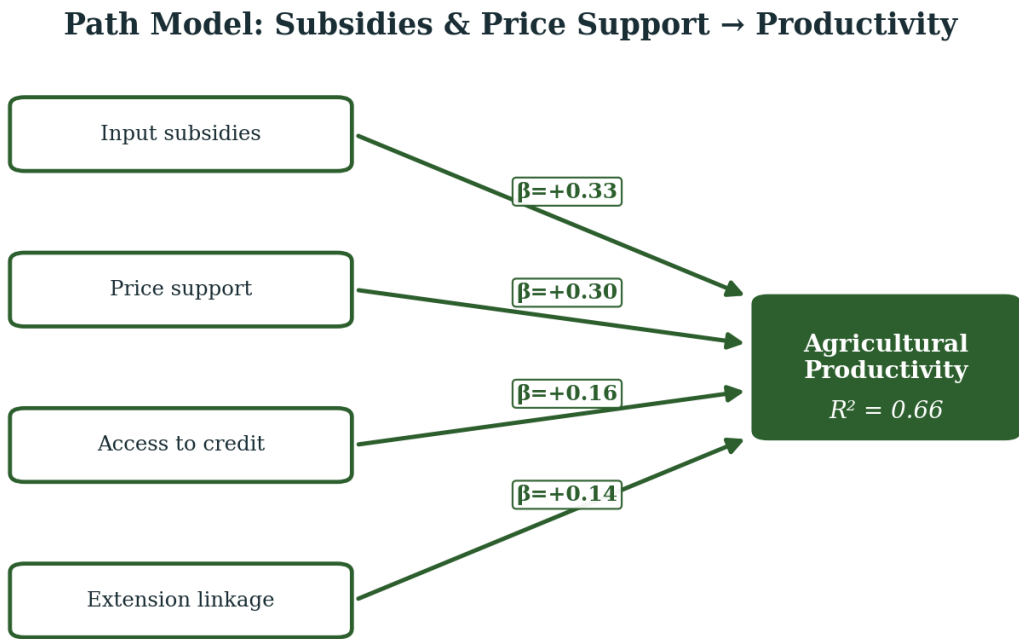


Figure 2: Structural model of government support and agricultural productivity showing standardised path coefficients (β) and $R^2 = 0.66$.

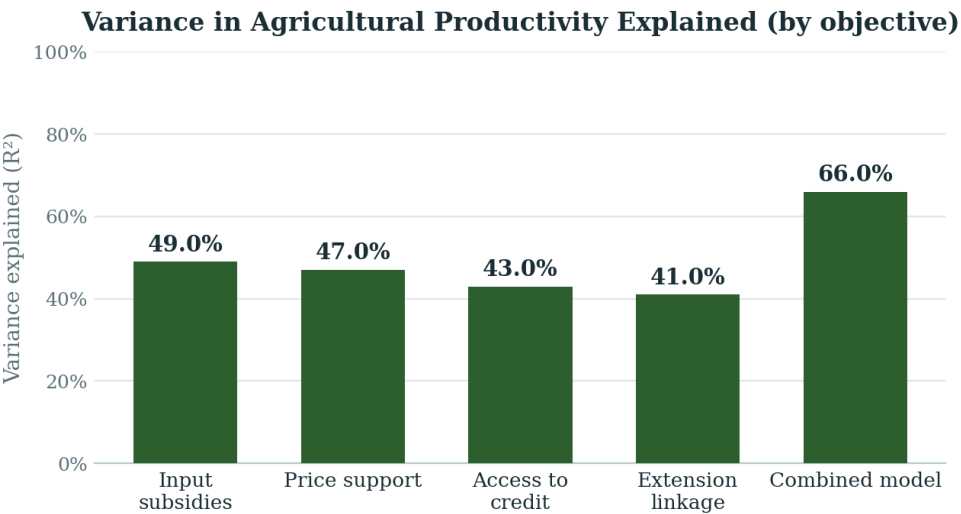


Figure 3: Variance in agricultural productivity explained across the study objectives.

Model Summary		Value		
R		0.812		
R Square		0.660		
Adjusted R Square		0.652		
Std. Error of Estimate		0.428		
F (4, 175)		84.93 (p = 0.000)		
Path (Predictor → Agricultural productivity)		Path coeff. (β)	t	Sig. (p)
Input subsidies → Productivity		0.33	4.86	0.000
Price support → Productivity		0.30	4.36	0.000
Access to credit → Productivity		0.16	2.58	0.011
Extension linkage → Productivity		0.14	2.26	0.025

Source: Primary Data, 2025

The structural model summary in Table 4 indicates that the four support dimensions jointly explained 66.0% of the variance in agricultural productivity ($R^2 = 0.660$), a large proportion that establishes government support as a major determinant of productivity. The model was highly significant ($F(4, 175) = 84.93, p < 0.01$). The remaining 34.0% of variance is attributable to factors outside the model, such as weather, soil quality, farmer skills, and land size (FAO, 2021).

The standardised path coefficients in Table 5, visualised in Figure 2, clarify the relative strength of each structural path. The path from input subsidies to productivity was the strongest ($\beta = 0.33, p < 0.01$), demonstrating that lowering

the cost of seeds, fertilizers, and other inputs has the greatest influence on productivity, since it enables cash-constrained smallholders to use inputs at productivity-enhancing levels, precisely as induced-innovation theory predicts (World Bank, 2021). The path from price support followed ($\beta = 0.30$, $p < 0.01$), confirming that stabilising and improving output prices materially raises productivity by reducing risk and improving returns (FAO, 2021). The paths from access to credit ($\beta = 0.16$, $p < 0.05$) and extension linkage ($\beta = 0.14$, $p < 0.05$) were positive and significant but more modest. Notably, price support was both among the lowest-rated dimensions descriptively and the second-strongest structural path, a convergence that identifies price support as an under-provided but highly influential intervention.

7.0 Discussion of Results

The findings of this study confirm that government subsidies and price support are strongly and significantly related to agricultural productivity in Balawoli, and the combination of factor analysis and the structural model clarifies both the structure of support and the relative weight of each intervention (Julius & Desire, 2025). The factor analysis established that government support is genuinely multidimensional, with input subsidies emerging as the dominant factor, and this was mirrored in the structural model, in which input subsidies was the strongest path predictor ($\beta = 0.33$) (Julius et al., 2026). This convergence is theoretically coherent and practically significant: for cash-constrained smallholders, the affordability of inputs is the binding constraint on productivity, and the finding that input subsidies most strongly drive productivity confirms that reducing input costs is the most effective single lever (World Bank, 2021). The interviews reinforced this, with farmers describing the cost of fertilizer and quality seed as the principal barrier to raising their yields.

The strong effect of price support ($\beta = 0.30$) indicates that stabilising and improving output prices is also decisive, consistent with risk-aversion theory's premise that smallholders under-invest when returns are uncertain (FAO, 2021). The convergence of price support being both among the lowest-rated dimensions and the second-strongest structural path is particularly instructive: it identifies price support as an intervention that is currently under-provided yet holds substantial potential to raise productivity, making it a priority for strengthening (Julius & Kazaara, 2026).

The more modest but significant contributions of access to credit ($\beta = 0.16$) and extension linkage ($\beta = 0.14$) are theoretically instructive. These interventions play enabling and complementary roles—credit finances input purchase and extension guides input use—that support the direct effects of subsidies and price support rather than driving productivity independently. That extension linkage was the highest-rated dimension yet the weakest structural path suggests that advice alone, without affordable inputs and remunerative prices, has limited effect on productivity (World Bank, 2021). This underscores the interdependence of the interventions.

8.0 Conclusion and Recommendations

The study concludes that government subsidies and price support have a strong, positive, and significant relationship with agricultural productivity in Balawoli, with input subsidies and price support being the most influential

interventions. It is recommended that government strengthen and expand input subsidy programmes with better targeting and timely delivery (World Bank, 2021); enhance price support to reduce farmers' price risk (FAO, 2021); improve access to affordable agricultural credit; and strengthen extension services to ensure inputs are used effectively. The complementary design of these interventions is emphasised. Future research could employ objective yield data and longitudinal designs to further establish causality.

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