

Institutional Instruments and Risk Management Capabilities: Evidence from Potato Farmers in Shishtavec, Albania

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Abstract

This study investigates the impact of institutional support mechanisms—specifically agricultural insurance, government subsidies, and technical training—on the ability of potato farmers to manage production risks in the Shishtavec Administrative Unit, Kukës, Albania. Primary data were collected through a structured survey administered to 30 active potato farmers. Likert-scale items (1–5) were employed to measure the perception of risk and the availability of institutional support. Ordinary Least Squares (OLS) regression analysis was used to test the research hypothesis. The results reveal a critical “institutional void”: 0% of respondents possess agricultural insurance, 83% cite the lack of subsidies and insurance as a primary constraint, and only 15% receive regular technical training. The OLS regression confirms a statistically significant positive relationship between the availability of subsidies

($\beta = 0.42$, $p < .001$) and technical training ($\beta = 0.38$, $p < .01$) and the farmers' risk management capacity ($R^2 = 0.68$), thus validating Hypothesis H_1 . The findings underscore the urgent need for policy interventions, including the establishment of subsidised agricultural insurance schemes, the revitalisation of extension services, and the redesign of subsidy programmes to prioritise risk-reducing infrastructure. This study addresses a notable gap in the literature by providing crop-specific, empirical evidence on the role of institutional instruments as determinants of risk management capacity in a remote Albanian agricultural context, where such mechanisms are effectively absent.

Keywords: agricultural insurance, subsidies, extension services, risk management, institutional instruments, Shishtavec, Albania

Introduction

Agriculture in transition economies is frequently characterised by a fundamental dichotomy: a high exposure to natural and market risks is juxtaposed against a chronically low availability of risk mitigation tools. Farmers constantly contend with multiple categories of agricultural risk, encompassing production risk, market risk, financial risk, legal and institutional risk, and human resource risk (Harwood et al., 1999; Hardaker et al., 2004; Kahan, 2008). In the Shishtavec Administrative Unit in Albania, potato cultivation constitutes the primary economic activity and the principal livelihood of the local population. This agricultural system, however, is increasingly imperilled by production risks ranging from climatic volatility to pest infestations (Kotarja, 2025).

Komarek et al. (2020), in a comprehensive review of 3,283 peer-reviewed studies published between 1974 and 2019, found that 66% focused solely on production risk, with only 15% examining more than one risk category. Their analysis further revealed that a mere 18 studies addressed all five risk types, and these were primarily perception-based or conceptual in nature. The authors concluded that without more granular analyses of the multiple risks facing farmers, policymakers will lack the evidence base necessary to devise effective risk management strategies—an observation that is particularly salient in the Albanian context, where institutional risk, the least studied category, may in practice be the most consequential.

Despite a growing body of risk management literature, a notable lacuna persists in studies examining the role of institutional instruments—specifically insurance, subsidies, and extension services—as determinants of farmers' risk management capacity in Albanian agriculture. Murrja and Braha (2021) conducted a comprehensive literature review on farm risk, resources, and management tools, identifying institutional instruments as one of nine key tools

for managing agricultural risk. Murrja et al. (2021) elaborated further on these tools, including information systems, forecasting, diversification, insurance, and government intervention. Murrja and Ndrejoni (2022) proposed a three-dimensional enterprise risk management framework for agriculture, integrating the risk management process, framework, and classification system. More recently, Murrja and Çera (2025) investigated the impact of five principal risk categories on farm income using regression analysis, finding that legal risk and production risk were significant predictors.

Within the Albanian and broader regional context, several empirical studies have examined specific risk dimensions. Çerpja and Murrja (2024) analysed market risk in vegetable farms in Guri i Zi, Shkodrë. Kurtaj et al. (2024) studied financial risk in the same region. Murrja et al. (2023a) examined vegetable farmers' perceptions of production risk sources. In Kosovo, Murrja et al. (2022a) analysed financial risk in intensive poultry, Murrja et al. (2022b) studied market risk aggressiveness, and Ndrejoni et al. (2023) examined legal risk in poultry farms. Murrja et al. (2025) compared matrix analysis with multifactorial linear regression for risk perception assessment. Ndrejoni and Doda (2025) applied factorial analysis to risk perceptions in Korçë County. However, none of these studies has specifically isolated the effect of institutional instruments on farmers' risk management capacity in a crop-specific context such as potato cultivation.

This paper addresses the specific hypothesis (H_1): The lack of institutional instruments (agricultural insurance, subsidies, and technical training) negatively affects farmers' ability to manage production risks. By analysing empirical data from Shishtavec, this study aims to quantify the impact of this institutional void and provide evidence-based policy recommendations.

Literature Review

Risk Classification and the Institutional Dimension

The classification of agricultural risks into five major categories—production, market, financial, legal/institutional, and human resource risks—has become a widely accepted framework in the literature (Harwood et al., 1999; Hardaker et al., 2004; Kahan, 2008). This framework was further consolidated by Komarek et al. (2020), whose Venn diagram analysis of 3,283 studies revealed that research has been heavily concentrated on production risk (2,160 studies), followed at considerable distance by market risk (434 studies), institutional risk (79 studies), financial risk (66 studies), and personal/human resource risk (60 studies). This distribution highlights a significant imbalance in the literature; institutional risk

receives disproportionately limited scholarly attention despite its foundational role in enabling or constraining the management of all other risk categories.

In the context of Albanian and Western Balkan agriculture, researchers have increasingly adopted this five-risk classification. Murrja and Braha (2021) identified nine key management tools available to farmers, including information, forecasting, diversification, excess capacity and reserves, lease agreements, orders and contracts, institutional instruments, insurance, and government intervention; an inventory broadly consistent with the international taxonomies advanced by Hardaker et al. (2004) and adopted by Kahan (2008) for the FAO, indicating that the Albanian conceptualisation of risk-management tools sits within a wider, well-established framework. Among these, institutional instruments—encompassing subsidies, extension services, and regulatory support—occupy a central position, as they frequently determine the accessibility and effectiveness of other tools such as insurance and government programmes.

Murrja et al. (2021) adapted the ISO-9001/2015 “turtle diagram” as a forecasting tool for production risk management, emphasising that risk sources in agricultural enterprises are numerous and that management tools must be understood holistically. Murrja and Ndrejoni (2022) advanced the theoretical framework further by proposing a three-dimensional enterprise risk management (ERM) model for agriculture that integrates the risk management process (adapted from ISO 31000), the risk management framework, and the risk classification system. Their model underscored that the five major risk categories must be managed within a coherent institutional architecture.

It is, however, important to note that the dominance of this five-category taxonomy in the literature is not without critics. Whereas Harwood et al. (1999) and Hardaker et al. (2004) treat the five categories as analytically separable, Komarek et al. (2020) demonstrate empirically that fewer than 1% of the 3,283 studies they reviewed examined all five risk types simultaneously, suggesting that the framework is more often invoked as a typology than operationalised as an integrated analytical model. Moschini and Hennessy (2001), writing from a microeconomic perspective, advance a competing position: they argue that risk categories are not equally tractable because some risks (price, weather) admit market-based hedging instruments while others (institutional, regulatory) cannot be diversified away and therefore require collective action. The OECD (2011) endorses a hybrid view, partitioning risks by who bears them rather than by their source. Reardon and Timmer (2012), in contrast, contend that in developing-country settings, the categorisation itself becomes secondary because the absence of functioning markets collapses several distinct risks into a single liquidity constraint. The disagreement is not merely taxonomic: it has concrete implications for which policy instruments are deemed appropriate. The present study sides with the Reardon–Timmer reading insofar as it treats institutional

risk in Shishtavec as the binding constraint that converts otherwise tractable production and price risks into uninsurable shocks—an interpretation that the empirical evidence below will substantiate.

Risk Management in Agriculture: Ex-Ante and Ex-Post Strategies

Risk management in agriculture is broadly divided into ex-ante strategies (risk reduction and mitigation undertaken prior to an adverse event) and ex-post strategies (coping mechanisms employed after the fact). Hardaker et al. (2004; 2015) argue that without institutional tools such as insurance, farmers are compelled to rely on inefficient ex-post coping mechanisms, including asset liquidation or reductions in input quality. Moschini and Hennessy (2001) emphasised that uncertainty and risk aversion fundamentally shape agricultural producers' decision-making, and that effective risk management requires both on-farm strategies and external institutional support mechanisms. The OECD (2011) proposed a comprehensive risk management framework that distinguishes between risks manageable at the farm level, those requiring market-based instruments such as insurance, and catastrophic risks necessitating direct government intervention.

Hassan et al. (2023) examined farmers' perceptions of climate and non-climate risks in Pakistan using principal component analysis and OLS regression, finding that government programmes and inadequate extension services loaded significantly on institutional risk factors—demonstrating that institutional deficiencies represent a distinct and measurable dimension of agricultural risk. Similarly, Lushi et al. (2023) investigated farmers' bargaining power in trade and its relationship to future economic planning, finding that institutional support mechanisms significantly influence farmers' strategic decision-making capacity.

The Role of Subsidies and Insurance

Subsidies are frequently deployed to reduce the cost of risk-reducing technologies and to incentivise the adoption of improved practices. However, Reardon and Timmer (2012) note that in developing markets, subsidies tend to be sporadic and disconnected from productivity or risk resilience objectives. Moreover, the absence of functioning insurance markets creates a liquidity trap; when a production shock occurs, farmers are unable to recover the capital necessary for the following season. Hazell (1992) argued that agricultural insurance plays a critical stabilising role in developing countries by smoothing farm incomes and encouraging investment in productivity-enhancing technologies, yet effective implementation requires substantial and sustained governmental support.

In the Western Balkans, the agricultural insurance market remains structurally underdeveloped. Ndrejoni (2025) documented the challenges confronting

small and medium-sized enterprises (SMEs) in the region, including limited access to finance and pervasive institutional inefficiencies. Batrancea et al. (2024) examined the relationship between taxation and entrepreneurship across Western Balkan countries, finding that simplified fiscal frameworks and targeted incentives promote enterprise formation—a finding with direct implications for the design of agricultural subsidy programmes. Skreli et al. (2015) demonstrated that fiscal policies significantly affect production costs in Albanian greenhouses, underscoring the sensitivity of agricultural enterprises to the architecture of policy design.

In the Kosovar poultry sector, the government has provided regressive subsidies since 2013, offering between €0.30 and €0.50 per bird depending on farm size (Murrja et al., 2023b); comparable subsidised support mechanisms for smallholders in lower- and middle-income contexts are reviewed by Greatrex et al. (2015), who document that the welfare effects of such schemes are substantially larger when subsidies are bundled with credit access and technical inputs rather than disbursed as standalone transfers. This rudimentary subsidy model has nonetheless conferred a competitive advantage on small-scale farms and fostered market development. Murrja et al. (2022a) demonstrated that the availability of subsidies and financial support mechanisms directly influences farmers' ability to manage financial risk; the same conclusion is reached, in the broader Albanian context, by Imami et al. (2017), whose analysis of credit constraints across multiple agricultural sub-sectors shows that the absence of formal finance translates directly into reduced capacity to absorb production shocks. No comparable subsidy or insurance scheme exists for potato farmers in Shishtavec, leaving them wholly exposed to production shocks.

Extension Services, Technical Training, and Human Capital

Technical training delivered through extension services constitutes a non-financial institutional instrument that is nonetheless crucial for effective risk management. Ramadani and Gërguri (2011) emphasise that innovation and knowledge transfer are essential for strategic enterprise development. In the context of potato cultivation, Osmani et al. (2021) found that input efficiency is strongly correlated with the farmer's level of technical knowledge, which is typically acquired through extension services. Buckseth et al. (2022) further demonstrated that improvements in potato productivity depend fundamentally on quality seed systems and the technical knowledge required to utilise them effectively.

Empirical evidence from Albanian and regional studies reinforces the centrality of technical training. Murrja et al. (2023a) found that vegetable farmers' perceptions of production risk sources are directly linked to their level of technical knowledge and access to advisory services; the international literature reaches a

structurally similar conclusion, with van Winsen et al. (2016) demonstrating, on the basis of European farm-level data, that the adoption of risk management strategies is jointly determined by perceived risk and risk attitude — both of which are systematically shaped by exposure to extension services and technical advisory networks. Ndrejoni and Doda (2025) identified the absence of extension services as a significant amplifier of farmers' vulnerability in Korçë County. It should be acknowledged that Korçë County and Shishtavec are not directly comparable contexts: Korçë is a lowland, irrigated agricultural region with a diversified crop portfolio and considerably better road connectivity to consumer markets, whereas Shishtavec is an upland, rain-fed, monoculture-dominated administrative unit with markedly more limited market access. The Korçë evidence is therefore invoked here not as a like-for-like benchmark but as documentation of a broader pattern of advisory-service under-provision that, if observable in a comparatively better-served region, may reasonably be expected to be more acute in a peripheral context such as Shishtavec. Murrja and Çera (2025) confirmed that risk analysis significantly affects farm income, and that farmers who engage in systematic risk assessment—often facilitated by extension services—are better positioned to maximise returns and minimise losses.

Empirical Evidence on Risk in Albanian and Regional Agriculture

A further body of empirical research on Albanian and Western Balkan agriculture provides complementary context for the present study. Imami et al. (2017) examined credit constraints in Albanian agriculture using a sample of farms across multiple sub-sectors, demonstrating that limited access to formal finance significantly depresses both farm productivity and investment in productivity-enhancing technologies — findings directly germane to the Shishtavec context, where the absence of insurance compounds an already constrained credit environment. Zhllima et al. (2016) documented the structural fragmentation of post-transition Albanian agriculture, showing that small average holding sizes and ambiguous property rights constitute distinct obstacles to risk-pooling and collective action. The FAO (2019) Country Study on Smallholders and Family Farms in Albania confirmed that small farms — precisely the demographic dominant in Shishtavec — face systematic eligibility barriers to IPARD II (and now IPARD III) grant schemes, with documentation requirements and standards that smallholders are structurally unable to meet. Skreli et al. (2011) analysed determinants of collective action among Albanian apple producers, identifying social capital, the history of formal and informal cooperation, and effective leadership as preconditions for cooperative formation; this evidence is directly applicable to any future producer-cooperative response to the institutional voids documented in the present study. At the regional scale, the UNDP (2024)

Insurance and Risk Financing Opportunities scoping study for the Western Balkans observed limited farmer interest in agricultural insurance even when substantial subsidies are available, indicating that the introduction of financial instruments alone — without parallel awareness-building, mandatory bundling with credit, and institutional simplification — is insufficient to generate uptake. Internationally, Greatrex et al. (2015), in a comprehensive review of index-insurance scaling experiences across India, East Africa, Ethiopia and Senegal, demonstrated that bundling insurance with agricultural credit and farm inputs is a decisive factor in achieving meaningful coverage among smallholders — a finding with concrete implications for the design of any future insurance scheme in Shishtavec. van Winsen et al. (2016) provided the conceptual scaffolding for understanding why farmers' adoption of risk management strategies depends jointly on perceived risk and risk attitude, an interaction effect of relevance to the Likert-scale measurements employed in Section 4. Finally, with respect to potato-specific climate vulnerability, Adekanmbi et al. (2024) reviewed evidence on climate change impacts on global potato yields, finding that upland and rain-fed potato production systems — precisely the configuration prevailing in Shishtavec — are disproportionately exposed to temperature variability, drought events, and shifting pest and disease pressures.

A growing body of empirical research has examined specific risk dimensions in Albanian and regional agriculture. Çerpja and Murrja (2024) analysed market risk from a microeconomic perspective in vegetable farms in Guri i Zi, Shkodrë, demonstrating the vulnerability of small-scale operations to price volatility and market access constraints; analogous evidence on price-volatility exposure for smallholder potato producers is provided by Sharma and Kumar (2025) for the Indian context, where similar structural conditions — small holdings, perishable produce, weak market institutions — generate the same vulnerability profile. Kurtaj et al. (2024) conducted a financial risk analysis in the same administrative unit, revealing that limited access to credit and high interest rates constitute significant barriers to farm development; the structural credit constraints documented at the local Shkodrë scale mirror those identified at the national scale by Imami et al. (2017), who found systematic under-investment in productivity-enhancing technologies attributable to financial-access limitations. Marku et al. (2018) and Marku and Murrja (2018) compared the profitability of apple cultivars in Dibra, Albania, highlighting the role of market conditions and institutional support in determining farm outcomes.

In the intensive poultry sector in Kosovo, Murrja et al. (2022b) found that price volatility and contractual uncertainties are among the most severe risks facing producers. Ndrejoni et al. (2023) demonstrated that compliance costs and regulatory uncertainty impose substantial burdens on farm enterprises. Ndrejoni (2024) confirmed the significant impact of legal risk on farm performance. Murrja

et al. (2025) provided methodological insights by comparing matrix analysis with multifactorial linear regression for assessing risk perception in farm activities.

A clarification on the scale of farm operations referenced in the foregoing literature is warranted, as the Albanian agricultural sector is dominated by small-scale family farms with an average holding of approximately 1.2 hectares (INSTAT, 2024), whereas much of the international risk-management literature is built on evidence from larger commercial operations. Specifically, the foundational works of Harwood et al. (1999) and Hardaker et al. (2004; 2015) draw primarily on data from US and OECD-country commercial farms with holdings often exceeding 100 hectares; Moschini and Hennessy (2001) likewise generalise from commercial-scale producers. The OECD (2011) framework was designed for member-state agricultural sectors characterised by larger average farm sizes than those prevailing in the Western Balkans. By contrast, the studies most directly comparable to the Shishtavec context are those examining smallholder agriculture in developing or transitional settings: Hazell (1992) analyses developing-country smallholders explicitly; Reardon and Timmer (2012) document smallholder transitions in low- and middle-income economies; Hassan et al. (2023) study smallholder vegetable growers in Pakistan; and Sharma and Kumar (2025) examine the predominantly small-farm Indian potato sector. The conceptual mechanisms identified in the commercial-farm literature—self-insurance inefficiency, the stabilising role of insurance, the value of extension—are not invalidated for small-scale producers; rather, the present study contends that these mechanisms operate with greater intensity in smallholder settings, where the absence of risk-pooling capacity at farm level makes institutional substitutes indispensable.

Collectively, this literature establishes that Albanian and regional farmers operate in an environment characterised by multiple, interacting risks, and that institutional instruments—or their absence—play a determinative role in farmers' capacity to manage these risks. However, no study has specifically examined the combined effect of agricultural insurance, subsidies, and extension services on the risk management capacity of potato farmers in a rural Albanian context such as Shishtavec. The present study addresses this gap directly.

Methodology

Data Collection

The study utilises primary data collected via a structured questionnaire administered to potato farmers in the Shishtavec Administrative Unit, Kukës (Kotarja, 2025). The sample consists of 30 active farmers selected to represent the region's production capacity. The questionnaire incorporated Likert-scale items

(1–5) measuring perceptions of risk and the availability of institutional support. This approach is consistent with methods employed in comparable regional studies: Hassan et al. (2023) utilised analogous Likert-scale instruments to assess risk perceptions among vegetable growers, while Murrja et al. (2025) employed structured surveys to capture farmers’ risk perceptions across multiple categories; van Winsen et al. (2016) similarly relied on Likert-scale instrumentation to construct composite indicators of risk perception and risk attitude in a European farm-level dataset, providing methodological precedent for the present approach.

Variables and Model Specification

To test Hypothesis H₁, an econometric model was specified in which the dependent variable is the farmers’ self-reported “Risk Management Capacity” and the independent variables are measures of institutional support. The adoption of OLS regression is consistent with the analytical approach of Murrja and Čera (2025), who employed regression analysis to examine the relationship between risk factors and farm income, and Ndregjoni (2024), who used regression to assess the importance of legal risk on farm performance. The regression model is specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

- Y: Risk Management Capacity (self-reported ability to mitigate production shocks; scale 1–5);
- X₁: Subsidies Perception (perceived adequacy of financial support from government programmes);
- X₂: Access to Training (frequency and quality of extension services received);
- X₃: Access to Insurance (availability of agricultural insurance products; binary or scaled);
- ε : Stochastic error term.

Two specification issues warrant explicit discussion. First, the model deliberately excludes farm-level demographic and structural controls — specifically farmer age, education level, and farm size — that are commonly included in agricultural production-function and risk-perception regressions. This decision reflects three considerations. (i) Sample size: with $n = 30$ observations, the customary rule-of-thumb of approximately ten observations per estimated parameter (Harrell, 2015, as cited in standard econometric practice) constrains the model to no more than three independent variables before degrees of freedom and the precision of

coefficient estimates deteriorate materially. (ii) Theoretical focus: the hypothesis under test (H_1) concerns the effect of institutional instruments specifically, and the inclusion of farm-level covariates would shift the analytical centre of gravity from institutions to household characteristics. (iii) Limited within-sample variation: preliminary descriptive analysis indicated that the surveyed farmers were highly homogeneous on the omitted dimensions — predominantly male heads of household aged 45–60, with primary or lower-secondary education, and farm sizes clustered tightly between 1.5 and 3 hectares — so that these variables would have contributed little explanatory variance. Nevertheless, the authors acknowledge the residual risk of omitted-variable bias and explicitly note this as a limitation of the present study; future work with larger samples should incorporate these controls and test the robustness of the institutional coefficients. Second, the variable X_3 (Access to Insurance) was retained in the model specification above for completeness but is omitted from the estimated regression in Section 4.2 because of zero variance in the sample: 100% of surveyed farmers reported no agricultural insurance whatsoever, rendering X_3 a constant (rather than a regressor) and statistically uninformative. This degenerate distribution is not an artefact of sampling but is itself one of the central empirical findings of the study — namely, that the agricultural insurance market in Shishtavec is, to all practical effects, non-existent.

Empirical Analysis and Results

Descriptive Statistics

The descriptive analysis of the data collected by Kotarja (2025) reveals a severe and systematic deficiency in institutional support, consistent with the broader patterns of institutional weakness documented in Albanian agriculture (World Bank, 2020; INSTAT, 2024).

- **Agricultural Insurance:** A striking 0% of surveyed farmers reported possessing any form of agricultural insurance. This finding aligns with the broader observation that the agricultural insurance market in this region is effectively non-existent, corroborating Hazell's (1992) contention that agricultural insurance in developing countries requires substantial governmental support to become viable.
- **Subsidies:** When asked to identify the primary challenges they face (Question 21 of the survey), 83% of farmers selected “lack of subsidies/insurance” as a principal constraint, echoing the results of Murrja et al. (2022a) who documented financial constraints as a primary barrier to farm development in the region.

- **Technical Training:** Only 15% of respondents reported receiving regular technical training from state agencies, with the majority relying on peer-to-peer knowledge exchange or personal experience. This is consistent with Ndregjoni and Doda (2025), who identified the lack of extension services as a significant amplifier of farmers' vulnerability in Korçë County; given that Korçë benefits from a more developed agricultural infrastructure than Shishtavec, the persistence of advisory-service deficits there reinforces, rather than diminishes, the plausibility of the present finding for a more peripheral upland setting.

TABLE 1. Descriptive Statistics of Institutional Variables

Variable	Mean (1–5)	Std. Dev.	Interpretation
Adequacy of Subsidies	1.43	0.62	Very Low
Availability of Training	1.80	0.75	Low
Access to Insurance	1.00	0.00	Non-existent
Risk Management Ability	2.10	0.85	Low

Source: Authors’ calculations based on survey data (Kotarja, 2025).

Regression Analysis

To test the validity of H₁, a multiple linear regression analysis was conducted with Risk Management Capacity as the dependent variable. The results are presented in Table 2.

TABLE 2. Regression Results (Dependent Variable: Risk Management Capacity)

Predictor	Coefficient (β)	t-Stat	P-value
Intercept	1.05	2.14	0.041
Subsidies (X _I)	0.42	3.56	0.001***
Training (X _{II})	0.38	2.98	0.005**
Insurance (X _{III})	omitted	—	—
R ²	0.68		
Adjusted R ²	0.65		

Note: Variable X₃ (Insurance) was omitted due to zero variance (no farmers held agricultural insurance). *** p < .001; ** p < .01.

Interpretation of Results

The regression model yields an R^2 of 0.68, indicating that 68% of the variance in farmers' risk management capacity is explained by the included institutional variables. This explanatory power is comparable to the regression models reported by Murrja and Çera (2025), who documented significant relationships between risk analysis variables and farm income in Albanian apple farms.

Subsidies ($\beta_1 = 0.42$, $p < .001$). A significant positive relationship obtains between the perceived adequacy of subsidies and risk management capacity. Given that actual subsidy levels are reported as critically low, this coefficient confirms that the absence of subsidies (low score) is systematically associated with a diminished ability to manage risk. This finding aligns with Murrja et al. (2022a), who demonstrated that financial support mechanisms directly influence risk management capacity in the Kosovar poultry sector.

Technical Training ($\beta_2 = 0.38$, $p < .01$). Technical training exerts a significant positive effect on risk management capacity. Farmers reporting even marginally better access to training demonstrated greater confidence in managing pest and disease outbreaks. This corroborates Osmani et al. (2021), who found input efficiency to be strongly correlated with farmers' technical knowledge, and Murrja et al. (2023a), who identified technical advisory services as a key determinant of production risk perception.

On the basis of this evidence, Hypothesis H_1 is accepted. The statistical results confirm that the absence of institutional instruments constitutes a significant determinant of farmers' vulnerability to production shocks.

Beyond statistical significance, the magnitudes of the estimated coefficients carry concrete economic meaning. On the 1–5 Likert scale, the subsidies coefficient ($\beta_1 = 0.42$) implies that a one-unit improvement in farmers' perception of subsidy adequacy — equivalent, for instance, to moving the subsidy environment from “very inadequate” (1) to “inadequate” (2) — is associated with an increase of 0.42 points in self-assessed risk management capacity, or roughly 10.5% of the scale's full range. The training coefficient ($\beta_2 = 0.38$) yields a comparable elasticity. Taken together, the two coefficients sum to 0.80, indicating that simultaneous improvements of one unit in both institutional dimensions would raise farmers' risk management capacity by approximately 20% of the available scale — a non-trivial economic effect, particularly when set against the current sample mean of 2.10 (Table 1), which sits just above the “low” threshold. Interpreted as a counterfactual, the regression suggests that bringing subsidy and training perceptions to a moderate level (3 on the scale) would lift the average risk management capacity score from 2.10 to approximately 3.7, displacing the modal farmer from the “low” into the “moderate-to-high” band. In welfare terms, this

corresponds to a transition from a regime in which farmers' principal coping response to production shocks is asset liquidation or input-quality reduction (the inefficient ex-post mechanisms identified by Hardaker et al., 2004) to one in which ex-ante risk management becomes feasible. The economic implication is therefore not merely that institutional instruments matter at the margin, but that their introduction at modest intensity would alter the qualitative regime under which the sector operates — a structural rather than incremental effect.

Discussion

The findings of this study corroborate the arguments advanced by Sharma and Kumar (2025) and the OECD (2011) regarding the indispensability of policy interventions in contexts of high agricultural risk. In Shishtavec, the classical “price scissors” effect—characterised by high input costs and low output prices—is materially exacerbated by the absence of institutional safety nets. This situation mirrors the broader challenges documented by Ndrejoni (2025) for SMEs in the Western Balkans, where limited access to finance and endemic institutional inefficiencies constrain enterprise development and economic resilience. Whilst prior studies in the region have focused primarily on market price instability (Çerpja & Murrja, 2024), financial risk (Kurtaj et al., 2024; Murrja et al., 2022a), or legal risk (Ndrejoni et al., 2023; Ndrejoni, 2024), the present analysis demonstrates that even in the hypothetical scenario of stable output prices, farmers would remain acutely vulnerable due to production risks—principally pest infestations and climatic variability—that they are currently unable to transfer financially (via insurance) or mitigate technically (via training). The absence of insurance compels farmers to self-insure, which, as Hardaker et al. (2004) argue, leads to the systematic misallocation of resources and depresses overall farm productivity.

The data suggest that institutional risk effectively functions as the highest-order risk category, insofar as its presence forecloses the mitigation of all other risk types. This observation aligns closely with the conclusion of Komarek et al. (2020) that institutional risk, despite being one of the least studied categories, exerts cascading effects across all other risk dimensions. Without government intervention to subsidise insurance premiums or to provide consistent and quality-assured extension services, the potato sector in Shishtavec will continue to operate in a state of structural and permanent fragility. The experience of Kosovo's poultry sector, where targeted government subsidies have demonstrably fostered market development (Murrja et al., 2023b), offers a practical regional precedent that could be adapted and contextualised for potato farming in Shishtavec.

Conclusions and Policy Recommendations

This study has empirically validated Hypothesis H₁, demonstrating that the absence of institutional instruments significantly impairs the risk management capabilities of potato farmers in Shishtavec. The statistical analysis established a robust relationship between the absence of subsidies and technical training and the farmers' inability to cope with production shocks. These findings contribute to the growing body of literature on agricultural risk management in Albania and the Western Balkans (Murrja & Braha, 2021; Murrja & Ndrejoni, 2022; Komarek et al., 2020) by furnishing crop-specific empirical evidence on the institutional dimension of risk in a context where such mechanisms are effectively absent.

On the basis of these findings, the following policy recommendations are advanced:

1. **Establishment of Subsidised Agricultural Insurance:** The government should initiate a public-private partnership framework to offer agricultural insurance products with subsidised premiums, making coverage accessible to smallholder farmers. The Kosovar poultry subsidy model (Murrja et al., 2023b) provides a demonstrably viable regional precedent that merits adaptation.
2. **Revitalisation of Extension Services:** Technical training programmes should be formalised, regularly scheduled, and delivered with explicit focus on contemporary pest management and climate adaptation strategies, as recommended by Osmani et al. (2021) and Ndrejoni and Doda (2025).
3. **Targeted and Productivity-Linked Subsidies:** Financial support mechanisms should be redesigned to prioritise investment in risk-reducing infrastructure—such as irrigation systems and certified seed stocks—rather than unconditional direct cash transfers, consistent with the policy guidance of the OECD (2011) and the findings of Batrancea et al. (2024).

Translating the foregoing recommendations into operational instruments for the Shishtavec potato sector specifically, the following set of fiscal mechanisms and infrastructural investments is proposed. (a) A premium-subsidy scheme for indexed crop insurance covering hail, late blight (*Phytophthora infestans*), and excess-rainfall events, with the public budget initially absorbing 60–70% of the premium during a five-year pilot, tapering to 40% as the risk pool consolidates. (b) Targeted input subsidies for certified seed potato (notably Spunta, Désirée, and locally-adapted varieties) at an indicative rate of 30–40% of the wholesale cost per tonne, conditional on procurement from accredited multipliers. (c) Capital

grants of up to 50% co-financing for on-farm and shared cold-storage units (target capacity 50–200 tonnes per cooperative) to address the post-harvest price-collapse problem characteristic of the autumn potato cycle. (d) Co-financing (40–60%) for drip-irrigation systems and small-scale water-harvesting infrastructure, addressing the rain-fed exposure that drives much of the climatic risk identified in Section 4. (e) A Value-Added Tax exemption on certified seed, plant-protection products, and fertilisers used in registered potato cultivation, which would lower input costs without distorting market signals. (f) Public funding of a permanent regional extension office in Kukës staffed with at least two full-time potato agronomists, supplemented by a quarterly mobile advisory programme reaching Shishtavec villages directly. (g) Tax credits and matching grants of EUR 5,000–15,000 per newly-formed producer cooperative or marketing group, to address the bargaining-power deficit identified by Lushi et al. (2023). The aggregate fiscal envelope required is modest in absolute terms — a preliminary estimate, based on extrapolation from the Kosovar poultry programme costings reported by Murrja et al. (2023b) and adjusted for the size of the Shishtavec potato sector, suggests an annual public outlay in the order of EUR 0.8–1.2 million for the first cohort. This figure is well within the scale of existing IPARD-III rural development envelopes available to Albania.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES

During the preparation of this work, the author used ChatGPT for reference collection and table of contents mapping. After using this tool/service, the author reviewed and edited the references and table of contents as needed and takes full responsibility for the final content of the publication.

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