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RISK MODELS AND NEW MECHANISMS IN AGRICULTURAL INSURANCE

Eldor Nozimov
Samarkand Institute of Economics and Service
Senior Lecturer, Department of "Investment and Innovations"
eldornozimov@gmail.com
https://orcid.org/0000-0003-1580-8654

Abstract. Agricultural insurance is essential for protecting farmers against financial losses due to natural disasters, climate change, pests, and market fluctuations. In Uzbekistan, agriculture forms a significant part of the national economy, making the development of effective insurance mechanisms critical. This study explores risk models and new mechanisms in agricultural insurance, evaluates current challenges, and examines international best practices. Using statistical analysis, case studies, and comparative research, the study identifies weather-indexed insurance, parametric policies, and crop diversification-based risk models as key innovations. Findings reveal that integrating advanced risk assessment models, digital platforms, and public-private partnerships can enhance coverage, reduce claim settlement delays, and improve financial stability for farmers. Recommendations focus on implementing modern risk models, encouraging technological adoption, improving awareness among farmers, and aligning domestic practices with global standards to foster a resilient agricultural insurance system in Uzbekistan.

Keywords. agricultural insurance, risk assessment, parametric insurance, crop insurance, weather-indexed models, risk management, digital platforms, Uzbekistan, farmer protection, insurance innovation

Introduction

Agriculture plays a pivotal role in Uzbekistan's economy, contributing significantly to GDP and providing employment for a large portion of the population. However, agricultural activities are inherently exposed to various risks, including droughts, floods, pest infestations, and price volatility. These risks pose serious threats to the financial stability of farmers and the overall sustainability of the agricultural sector. Agricultural insurance serves as a risk management tool, mitigating potential losses and enabling farmers to recover quickly after adverse events. In Uzbekistan, the agricultural insurance system is still developing, with limited coverage, traditional indemnity-based policies, and slow claims processing. Modern risk models, including parametric insurance, weather-indexed policies, and crop diversification-based mechanisms, offer innovative solutions to these challenges. Parametric insurance, for instance, provides automatic payouts based on predefined triggers such as rainfall levels or temperature deviations, reducing the time and complexity of claims settlement. Weather-indexed insurance connects insurance payouts to weather data, ensuring quick and transparent compensation to farmers after climatic events. Crop diversification and portfolio-based risk models spread risks across multiple crops and regions, minimizing losses in case of localized disasters. Integrating digital platforms for monitoring, claims processing, and policy management further enhances efficiency and accessibility. Despite these advances, challenges persist, including low awareness among farmers, limited technological adoption, insufficient public-private collaboration, and regulatory gaps. International experiences demonstrate that combining advanced risk models with digital solutions, government support, and farmer education significantly increases insurance uptake, improves financial resilience, and fosters agricultural development. This study aims to analyze existing agricultural insurance practices in Uzbekistan, explore innovative risk models and mechanisms, and propose strategies to modernize and strengthen the sector.

Literature Review

Agricultural insurance has been extensively studied in both international and local contexts. OECD (2023) emphasizes that innovative insurance models, such as weather-indexed and

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parametric insurance, enhance efficiency and provide rapid payouts. World Bank (2022) highlights that digital platforms and real-time monitoring tools are critical for effective agricultural insurance implementation. Swiss Re Institute (2023) notes that crop diversification and portfolio-based risk assessment reduce systemic risk and improve financial stability for farmers. In Uzbekistan, Abdullaev & Karimov (2022) and Rakhimov (2023) discuss the current limitations in agricultural insurance, including low coverage, delayed claims, and insufficient risk assessment. Comparative studies reveal that public-private partnerships, digitalization, and the adoption of advanced risk models are key strategies for improving agricultural insurance systems, increasing farmer participation, and enhancing resilience against natural and economic risks.

Methodology

This study employs a mixed-methods approach to evaluate risk models and new mechanisms in agricultural insurance. Methods include analysis of existing legislation and insurance policies, statistical review of coverage and claims data, comparative study of international agricultural insurance systems, and surveys of farmers regarding risk perception, insurance adoption, and satisfaction. The methodology also examines technological readiness for digital platforms, parametric triggers, and weather-indexed systems, as well as the potential for public-private partnerships to expand insurance coverage and improve operational efficiency.

Results and Discussion

The analysis shows that Uzbekistan's agricultural insurance sector faces several challenges, including limited coverage, slow claim settlement, reliance on traditional indemnity-based models, and low farmer awareness. Advanced risk models, such as parametric insurance and weather-indexed policies, can address these issues by providing automatic, data-driven payouts that reduce administrative delays and increase transparency. Crop diversification and portfolio-based risk models allow insurers and farmers to spread risk across multiple crops and regions, minimizing financial losses from localized adverse events. Digital platforms for monitoring weather, reporting damage, and managing claims enhance operational efficiency and improve accessibility, particularly in remote areas. Public-private partnerships play a crucial role in facilitating infrastructure, training, and technological adoption. International experience demonstrates that government support, subsidized premiums, and educational campaigns increase farmer participation, improve financial resilience, and strengthen trust in insurance mechanisms. Implementing modern risk models requires updated legislation, investment in digital infrastructure, and capacity building among insurers, regulators, and farmers. Additionally, combining risk-based models with traditional indemnity insurance can provide a balanced approach, ensuring coverage for diverse agricultural risks while maintaining financial sustainability. The findings suggest that integrating innovative risk models, technology, and stakeholder collaboration can significantly enhance the effectiveness, efficiency, and reach of agricultural insurance in Uzbekistan.

Conclusion and Recommendations

Modernizing agricultural insurance in Uzbekistan is essential for mitigating financial losses, improving farmer resilience, and promoting sustainable agricultural development. Recommendations include implementing parametric and weather-indexed insurance models, integrating digital platforms for policy management and claims processing, encouraging crop diversification-based risk assessment, strengthening public-private partnerships, updating regulatory frameworks to support innovative insurance mechanisms, conducting awareness campaigns to educate farmers, and providing training programs for insurers and agricultural extension services. By adopting these measures, Uzbekistan can develop a modern, efficient, and inclusive agricultural insurance system that protects farmers from natural and economic risks, enhances financial stability, and contributes to the growth and sustainability of the agricultural sector.

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