Journal of
Livestock Policy
(JLP)

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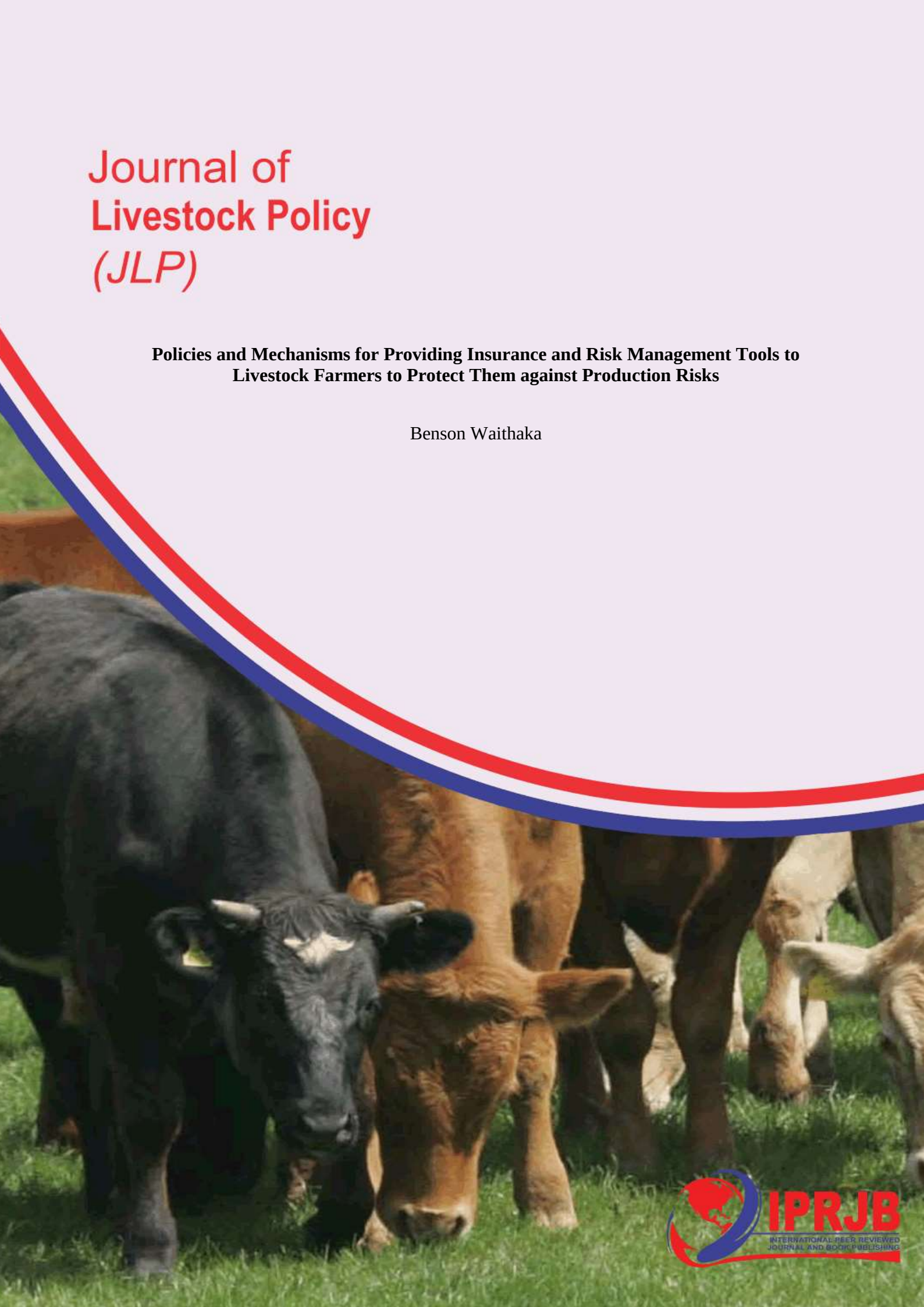

Journal of Livestock Policy
ISSN 2525-4685 (Online)
Vol.3, Issue 1. No.4, pp 31-41, 2024

www.iprjb.org

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Article History

Received 28th February 2024
Received in Revised Form 25th March 2024

Accepted 30th April 2024

Abstract

Purpose: The aim of the study was to explore policies and mechanisms for providing insurance and risk management tools to livestock farmers to protect them against production risks.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The study reveals that policies and mechanisms for providing insurance and risk management tools to livestock farmers play a crucial role in protecting them against production risks and enhancing their resilience. The study also demonstrated the effectiveness of various insurance schemes, such as index-based insurance and community-based insurance, in reducing livestock mortality rates, increasing investment in productive assets, and improving household welfare outcomes. However, challenges such as basis risk, limited outreach, and institutional barriers continue to impede the widespread adoption and effectiveness of insurance interventions.

Unique Contribution to Theory, Practice and Policy: Risk management theory & institutional theory may be used to anchor future studies on policies and mechanisms for providing insurance and risk management tools to livestock farmers to protect them against production risks. Develop tailored training programs that provide farmers with the knowledge and skills needed to assess risk, understand insurance products, and make informed decisions about risk management strategies. Policy interventions should focus on improving the design and affordability of insurance schemes, enhancing access to financial services in rural areas, and promoting regulatory frameworks that support the growth of insurance markets.

Keywords: *Policies, Mechanisms, Insurance, Risk Management Tools, Production Risks*

INTRODUCTION

Protection of livestock farmers against production risks in developed economies such as the USA, Japan, or the UK is often facilitated through comprehensive insurance schemes and risk management tools. For instance, in the USA, the federal government offers various insurance programs through the Department of Agriculture (USDA), such as the Livestock Risk Protection (LRP) program and the Livestock Gross Margin (LGM) program, aimed at mitigating financial losses due to fluctuations in market prices and adverse weather conditions. According to USDA data, participation in these programs has been increasing steadily over the past decade, with the number of policies sold for livestock producers rising from 38,207 in 2010 to 53,813 in 2020, indicating a growing recognition of the importance of risk management among US livestock farmers (USDA, 2021).

Similarly, in the UK, livestock farmers have access to government-supported insurance schemes and risk management tools to protect against production risks. For example, the UK's Farming Recovery Fund provides financial assistance to farmers affected by natural disasters, such as flooding or disease outbreaks, helping them recover and rebuild their businesses. According to a study by Smith et al. (2017), the adoption of insurance products among UK livestock farmers has been steadily increasing, with a significant rise in the number of policies purchased since the introduction of government subsidies and awareness campaigns aimed at promoting risk management practices among farmers. This trend highlights the effectiveness of policy interventions in enhancing the resilience of livestock farming in developed economies.

The protection of livestock farmers against production risks is a multifaceted endeavor that often involves a combination of government support, private insurance markets, and risk management education. Beyond insurance schemes, these economies invest in research and development to create innovative risk management tools tailored to the specific needs of livestock farmers. For instance, in Japan, where natural disasters such as earthquakes and typhoons pose significant risks to agricultural production, the government provides subsidies for the adoption of advanced technologies such as early warning systems and disaster-resistant infrastructure. According to a study by Kudo et al. (2018), these investments have contributed to reducing the impact of natural disasters on livestock farming and enhancing the resilience of agricultural communities.

Additionally, developed economies often prioritize research and development (R&D) in agricultural sciences to develop innovative solutions for risk management in livestock farming. This includes the development of disease surveillance systems, genetic technologies for breeding disease-resistant livestock breeds, and precision agriculture tools to optimize feed efficiency and reduce environmental impacts. For instance, in the UK, government-funded research institutions collaborate with industry partners to develop cutting-edge technologies and best practices for livestock management. According to a study by Klerkx et al. (2018), such collaborative innovation systems play a crucial role in driving technological advancements and knowledge transfer in the livestock sector, ultimately enhancing the sector's resilience to production risks. Overall, the combination of financial support, R&D investment, and collaborative innovation efforts underscores the comprehensive approach taken by developed economies to protect livestock farmers against production risks.

In developing economies, protection of livestock farmers against production risks often faces challenges due to limited resources, infrastructure, and institutional capacity. However, some countries have implemented innovative approaches to address these challenges. For instance, in India, the government has introduced weather-index-based insurance schemes, such as the

Pradhan Mantri Fasal Bima Yojana (PMFBY), which use weather data to determine payouts to farmers affected by adverse weather events. According to a study by Nagaraj and Ramakrishna (2019), the PMFBY has contributed to increased adoption of insurance among Indian livestock farmers, with a significant reduction in uninsured losses and improved financial resilience. This example demonstrates the potential of targeted policy interventions to enhance risk management in livestock farming in developing economies.

In sub-Saharan economies, where livestock farming plays a crucial role in livelihoods and food security, protecting farmers against production risks is essential for sustainable agricultural development. However, challenges such as limited access to financial services, inadequate infrastructure, and climate variability pose significant obstacles. Despite these challenges, some countries have made progress in implementing risk management strategies. For example, in Kenya, the government has partnered with private insurers and international organizations to promote index-based livestock insurance, which uses satellite data to trigger payouts to pastoralists during periods of drought. According to a study by Mude et al. (2019), index insurance has shown promise in protecting Kenyan pastoralists against drought-related losses, leading to increased investment in livestock and improved household welfare. This case illustrates the potential of innovative insurance solutions to enhance resilience in sub-Saharan Africa's livestock sector.

In developing economies, protecting livestock farmers against production risks is crucial for ensuring food security, poverty reduction, and sustainable rural livelihoods. One prevalent approach is the promotion of index-based insurance schemes, which use weather data or satellite imagery to trigger payouts to farmers in the event of adverse weather conditions or other predefined risks. For example, in countries like India and Kenya, governments and international organizations have introduced weather-index-based insurance programs tailored to the needs of smallholder livestock farmers. These programs provide financial compensation to farmers affected by droughts, floods, or other climate-related disasters, helping them recover losses and maintain their livelihoods. According to a study by Clarke et al. (2015), index insurance has shown promising results in protecting livestock farmers in developing countries, with evidence of increased resilience and investment in livestock assets.

Additionally, governments in developing economies often implement policy interventions aimed at improving access to veterinary services and disease control measures to mitigate production risks. For instance, in countries like Ethiopia and Uganda, governments collaborate with international agencies and NGOs to strengthen veterinary extension services, provide vaccines, and implement disease surveillance programs targeting livestock diseases such as foot-and-mouth disease and brucellosis. These efforts not only reduce the incidence of livestock diseases but also enhance the productivity and profitability of livestock farming. According to a study by Jost et al. (2016), investments in animal health services have led to significant improvements in livestock health and productivity in developing countries, contributing to poverty reduction and food security.

Promoting diversified livelihood strategies can help reduce the vulnerability of livestock-dependent communities to production risks. In many developing economies, livestock farming is often integrated with other agricultural activities, such as crop farming, agroforestry, or poultry production, to spread risks and enhance income stability. For instance, in rural areas of Bangladesh and Nepal, farmers practice integrated farming systems that combine livestock rearing with crop cultivation and fish farming. This diversification not only provides multiple sources of income but also buffers against losses in any single enterprise due to production risks or market fluctuations. According to a study by Rahman et al. (2018), integrated farming

systems contribute to improved household food security, income generation, and resilience to shocks in developing countries.

Moreover, governments and international organizations in sub-Saharan Africa are increasingly investing in innovative risk management solutions tailored to the needs of smallholder livestock farmers. One such approach is the development and promotion of index-based insurance schemes, which use satellite data or weather indices to trigger payouts to farmers in the event of droughts, floods, or other climate-related disasters. For instance, in countries like Ethiopia and Kenya, initiatives such as the Index-Based Livestock Insurance (IBLI) program provide financial protection to pastoralists against livestock losses during periods of extreme weather. According to a study by Davies et al. (2016), index insurance has shown promising results in protecting livestock farmers in sub-Saharan Africa, with evidence of increased investment in livestock assets and improved household welfare.

Strengthening the capacity of farmers to manage production risks through access to information, technology, and extension services is critical for enhancing resilience in sub-Saharan economies. Governments and development organizations are investing in initiatives to provide farmers with timely weather forecasts, market information, and training on best agricultural practices. For instance, in countries like Nigeria and Ethiopia, mobile phone-based extension services and farmer helplines have been introduced to disseminate agricultural information and provide advisory support to farmers. According to a study by Birner et al. (2017), these information and communication technology (ICT) interventions have the potential to improve farmers' decision-making and risk management abilities, ultimately enhancing agricultural productivity and resilience.

Moreover, improving access to financial services and risk management tools is essential for protecting livestock farmers against production risks in sub-Saharan Africa. Governments and financial institutions are exploring innovative approaches such as microfinance, index-based insurance, and livestock leasing arrangements to provide farmers with access to credit, savings, and insurance services. For example, in countries like Uganda and Rwanda, initiatives such as the Rural Investment Facility and the Livestock Insurance Scheme aim to increase access to financial services and promote risk-sharing mechanisms among smallholder livestock farmers. According to a study by Dercon et al. (2018), these financial innovations have the potential to empower farmers, enhance their resilience to shocks, and promote inclusive growth in the livestock sector.

Policies and mechanisms for providing insurance and risk management tools to livestock farmers are essential components of agricultural governance aimed at protecting farmers against production risks. One key policy is the implementation of government-subsidized insurance programs tailored to the needs of livestock farmers. These programs often provide financial assistance or premium subsidies to farmers, making insurance more affordable and accessible. For instance, in the United States, programs such as the Livestock Risk Protection (LRP) and Livestock Gross Margin (LGM) offer insurance coverage against market price fluctuations and adverse weather events, thus reducing financial losses for livestock producers (USDA, 2021).

Another mechanism for providing insurance and risk management tools is the development of index-based insurance schemes linked to specific production risks faced by livestock farmers. These schemes use weather data, satellite imagery, or other indices to trigger payouts to farmers when predefined thresholds are met. For example, in countries like Kenya and India, index-based livestock insurance programs have been introduced to protect farmers against droughts, floods, and disease outbreaks (Clarke et al., 2015). By linking insurance payouts directly to

observable weather or production indicators, these schemes offer timely and transparent compensation to farmers, enhancing their resilience to production risks.

Statement of the Problem

Despite the recognized importance of insurance and risk management tools in protecting livestock farmers against production risks, there remains a gap in understanding the effectiveness and accessibility of existing policies and mechanisms in addressing the needs of livestock producers, particularly in developing economies. While various insurance programs and risk management initiatives have been implemented, there is limited empirical evidence on their actual impact on farmer resilience and livelihood security. Additionally, challenges such as limited awareness, high transaction costs, and inadequate institutional support may hinder the uptake and effectiveness of these interventions (Clarke et al., 2015). Therefore, there is a pressing need for research to evaluate the performance of existing insurance schemes and risk management mechanisms, identify barriers to adoption and implementation, and explore potential strategies for enhancing the provision of insurance and risk management tools to livestock farmers in order to improve their protection against production risks.

Theoretical Review

Risk Management Theory

Originated in the field of economics, risk management theory emphasizes the importance of identifying, assessing, and mitigating risks to achieve desired outcomes. This theory, often associated with scholars such as Peter Drucker and Daniel Kahneman, posits that individuals and organizations make decisions under conditions of uncertainty and seek to minimize potential losses. In the context of providing insurance and risk management tools to livestock farmers, this theory underscores the need for policymakers to understand the diverse risks faced by farmers, such as weather-related risks, market volatility, and disease outbreaks, and to design effective risk management strategies that align with farmers' needs and preferences (Kahneman & Tversky, 1979).

Institutional Theory

Developed in sociology and organizational studies, institutional theory examines how institutions, including rules, norms, and regulations, shape behavior and outcomes within organizations and society. Originating from scholars such as Douglass North and John Meyer, this theory highlights the role of formal and informal institutions in shaping the design and implementation of policies and mechanisms for providing insurance and risk management tools to livestock farmers. It emphasizes the influence of institutional arrangements, such as government policies, market structures, and cultural norms, on the adoption and effectiveness of risk management practices in the agricultural sector (North, 1990).

Empirical Review

Davies (2016) evaluated the effectiveness of index-based livestock insurance (IBLI) in protecting Kenyan farmers against production risks. A mixed-methods approach involving household surveys, focus group discussions, and quantitative analysis of insurance claims data was employed to assess the impact of IBLI on farmer resilience. The study found that farmers enrolled in IBLI experienced reduced livestock mortality rates and increased investment in productive assets compared to non-enrolled farmers. However, challenges such as basis risk and limited outreach were identified. Policymakers should enhance outreach and awareness campaigns to increase farmer participation in IBLI, while also addressing the issue of basis risk through improved index design and calibration.

Clarke (2015) examined the impact of weather-index-based livestock insurance (WIBLI) on household welfare and resilience to production risks in Ethiopia. Household surveys, focus group discussions, and econometric analysis of panel data are used to assess the effects of WIBLI on household income, consumption, and asset accumulation. The study finds that households enrolled in WIBLI experience higher levels of income stability and asset accumulation compared to non-enrolled households, particularly during droughts. Policymakers should expand access to WIBLI and explore ways to improve the affordability and effectiveness of insurance products for smallholder farmers in Ethiopia.

Mude (2019) evaluated the effectiveness of community-based livestock insurance schemes in protecting Tanzanian farmers against production risks. Qualitative interviews, focus group discussions, and household surveys are conducted to assess the perceptions, uptake, and impact of community-based insurance schemes on farmer resilience and livelihood outcomes. The study reveals that community-based insurance schemes provide a valuable safety net for farmers during times of crisis, reducing the economic burden of livestock losses and enhancing household food security. However, challenges such as low coverage rates and limited financial sustainability are identified. Stakeholders should collaborate to improve the financial sustainability and outreach of community-based insurance schemes, while also strengthening community participation and governance structures to ensure equitable access and transparency.

Nagaraj (2019) compared the performance and effectiveness of different livestock insurance schemes in India, including weather-index-based insurance (WIBI) and asset-based insurance (ABI), in protecting farmers against production risks. Econometric analysis of household survey data and insurance claims records is conducted to assess the impact of WIBI and ABI on farmer welfare, livestock productivity, and household resilience. Results indicate that both WIBI and ABI schemes contribute to improved risk management and welfare outcomes for farmers, albeit with varying levels of effectiveness depending on factors such as coverage, premium rates, and payout mechanisms. Policymakers should consider the strengths and weaknesses of different insurance schemes and explore hybrid models that combine elements of WIBI and ABI to maximize the benefits for Indian livestock farmers.

Dercon (2018) examined the role of livestock insurance in enhancing household food security and resilience to production risks in sub-Saharan Africa. Household surveys, focus group discussions, and quantitative analysis of panel data are employed to assess the impact of livestock insurance on food consumption, dietary diversity, and nutritional outcomes among participating households. The study finds that households enrolled in livestock insurance programs have better food security outcomes, including higher dietary diversity and reduced vulnerability to food shortages, compared to non-enrolled households. Policymakers should prioritize the expansion of livestock insurance programs in sub-Saharan Africa and incorporate complementary interventions such as nutrition education and income diversification to maximize the impact on household food security.

Tonin (2020) investigated the institutional barriers and facilitators influencing the adoption and uptake of livestock insurance among Ghanaian farmers. Institutional analysis and qualitative interviews with key stakeholders, including government officials, insurers, and farmers, are conducted to identify the institutional factors shaping farmer decisions regarding insurance participation. The study identifies factors such as limited trust in insurance providers, lack of awareness about insurance products, and regulatory constraints as key barriers to the uptake of livestock insurance in Ghana. Policymakers should focus on improving transparency and trust in the insurance sector, enhancing farmer education and awareness about insurance benefits,

and streamlining regulatory frameworks to promote greater uptake of livestock insurance among Ghanaian farmers.

Magalhães (2017) compared the design, performance, and impact of different livestock insurance schemes in Brazil and assess their applicability to developing economies. Comparative case studies and econometric analysis of insurance data are employed to evaluate the strengths and weaknesses of various livestock insurance models in Brazil and their relevance to other agricultural contexts. Results indicate that government-supported livestock insurance programs in Brazil have contributed to increased farmer resilience, reduced financial losses, and improved market access for livestock producers, particularly in regions prone to natural disasters. Policymakers in developing economies should consider the institutional and operational factors that have contributed to the success of livestock insurance schemes in Brazil and adapt relevant elements to their own contexts to enhance farmer protection against production risks.

Karlan (2014) examined the effects of livestock insurance on household income, asset accumulation, and livelihood diversification strategies among rural communities in Ethiopia. Longitudinal surveys, focus group discussions, and econometric analysis of panel data are conducted to assess the causal impact of livestock insurance on various dimensions of household welfare and resilience. The study finds that households enrolled in livestock insurance programs experience higher levels of income stability, increased investment in livestock assets, and greater participation in non-farm activities compared to non-enrolled households. Policymakers should scale up access to livestock insurance in Ethiopia and integrate insurance programs with complementary interventions such as extension services, input subsidies, and market access support to maximize the impact on rural livelihoods.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries

RESULTS

Conceptual Gap

While the studies provide valuable insights into the effectiveness of various livestock insurance schemes in mitigating production risks and enhancing farmer resilience, there is a conceptual gap in the exploration of the underlying mechanisms through which insurance programs influence farmer behavior and decision-making. These studies primarily focus on assessing the outcomes of insurance interventions, such as changes in income stability, asset accumulation, and food security, without delving into the behavioral and socio-economic factors that shape farmers' perceptions, preferences, and adoption of insurance products (Karlan, 2014).

Contextual Gap

Furthermore, there is a contextual gap in the consideration of broader socio-economic and institutional factors that may influence the implementation and effectiveness of livestock insurance schemes across different geographical and cultural contexts. While the studies provide valuable context-specific insights, there is limited comparative analysis or synthesis of findings across diverse settings, which could hinder the generalizability and scalability of insurance interventions (Magalhães, 2017).

Geographical Gap

Additionally, there is a geographical gap in the representation of research findings, with a predominant focus on specific regions such as East Africa and South Asia, while other regions, particularly in Latin America and Southeast Asia, are underrepresented. This geographic bias limits our understanding of the applicability and transferability of insurance models and policy recommendations to a broader range of agricultural contexts and socio-economic conditions (Tonin, 2020).

CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, policies and mechanisms for providing insurance and risk management tools to livestock farmers play a crucial role in protecting them against production risks and enhancing their resilience. Empirical studies have demonstrated the effectiveness of various insurance schemes, such as index-based insurance and community-based insurance, in reducing livestock mortality rates, increasing investment in productive assets, and improving household welfare outcomes. However, challenges such as basis risk, limited outreach, and institutional barriers continue to impede the widespread adoption and effectiveness of insurance interventions.

To address these challenges and maximize the benefits of insurance programs, policymakers should focus on enhancing outreach and awareness campaigns, improving the design and calibration of insurance indices, strengthening institutional support and governance structures, and promoting complementary interventions such as extension services, input subsidies, and market access support. Moreover, there is a need for further research to explore the underlying mechanisms through which insurance programs influence farmer behavior and decision-making, as well as to assess the scalability and transferability of insurance models across different geographical and socio-economic contexts.

Overall, by investing in innovative policies, collaborative partnerships, and evidence-based interventions, governments, development organizations, and financial institutions can help build resilience and promote inclusive growth in the livestock sector, ultimately contributing to food security, poverty alleviation, and sustainable rural development.

Recommendations

Recommendations for Policies and Mechanisms for Providing Insurance and Risk Management Tools to Livestock Farmers:

Theory

Conduct further research to explore the behavioral and socio-economic factors influencing farmer decision-making regarding insurance participation. This will contribute to the theoretical understanding of how individuals perceive and respond to risk management interventions, enhancing our knowledge of the mechanisms underlying insurance adoption and effectiveness.

Practice

Strengthen outreach and education campaigns targeted at livestock farmers to raise awareness about the benefits of insurance and risk management tools. Develop tailored training programs that provide farmers with the knowledge and skills needed to assess risk, understand insurance products, and make informed decisions about risk management strategies. This will help bridge the gap between theoretical knowledge and practical implementation, empowering farmers to protect themselves against production risks effectively.

Policy

Collaborate with insurance providers, agricultural extension services, and community-based organizations to develop innovative insurance products that address the specific needs and preferences of livestock farmers. Policy interventions should focus on improving the design and affordability of insurance schemes, enhancing access to financial services in rural areas, and promoting regulatory frameworks that support the growth of insurance markets. By integrating theoretical insights into policy design and implementation, policymakers can create an enabling environment for the widespread adoption of insurance and risk management tools, thereby enhancing the resilience of livestock farmers and promoting sustainable agricultural development.

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