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Review on Regulatory Framework and Identification of Challenges and Opportunities in Accessing Insurance Products among Smallholder Farmers in Tanzania

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ABSTRACT: Crop insurance is generally considered to be essential for managing agricultural risks and enhancing farmers' resilience to natural disasters,pests and climate change. This paper reviews the regulatory framework and identifies challenges and opportunities in accessing insurance products among smallholder farmers in Tanzania using appropriate techniques. Key findings include low premium penetration and adoption; limited uptake, low awareness, and limited demand. Despite the implementation of pilot projects, crop insurance has yet to achieve widespread adoption due to slow progression. Microinsurance initiatives struggle due to financial constraints, infrastructural deficiencies, and inadequate farmer education. However, significant constraints persist, including high minimum capital requirements and limited distribution channels, which disproportionately affect smallholder farmers. Traditional attitudes, economic constraints, and mistrust contribute to the limited effectiveness of crop insurance. Addressing these issues requires a re-evaluation of insurance frameworks to serve Tanzanian smallholder farmers better and facilitate affordable and accessible insurance products.

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In Africa, over 65% of the population resides in rural areas and depends largely on rainfed agriculture, which is highly susceptible to unpredictable weather patterns thus making it an unreliable source of livelihood due to increasing occurrences of droughts, floods, pests, and diseases (Seyyedmajid *et al*, 2024: Cheng, 2024: Abbas *et al*, 2023: Matchangu, 2023: Yeleriere *et al*, 2023: Weldemariam *et al*, 2023: ILO, 2023: Shikwambana, 2022). In Tanzania, agriculture is the backbone of the economy, engaging around 65% of the labour force and contributing approximately 29% to the country's GDP (FAO,2021: Matchangu,2023: Domitian, 2024: Mtui, 2023: Kristal *et al*, 2023: Mtaturu, 2020: Mkondo, 2021. Mayala, 2021). In this context, crop insurance becomes crucial for managing agricultural risks and enhancing farmers' resilience. Effective crop insurance helps mitigate the financial impact of natural disasters, pests, and adverse climatic conditions by compensating for crop losses. This is essential for ensuring food security and economic stability, as it protects farmers from substantial financial losses that could otherwise lead to insolvency and decreased production levels. By covering the costs of crop failures, insurance aids in sustaining farming activities and stabilizing food prices, which ultimately supports national food security (Beula, 2024: Karthick *et al*, 2024: Jianping *et al*, 2024: Matchangu, 2023: ILO,2023). Government support for agricultural insurance

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schemes is vital for boosting the competitiveness of farm products both locally and internationally. Government backing helps develop and expand insurance markets, making insurance more accessible and affordable for smallholder farmers (ILO,2023: Rudramuni and Venkatesh, 2024: Ruan and Zhang, 2024: Saha, 2024: Glotova. *et al*, 2024). The role of government regulation in microinsurance cannot be overstated. Regulatory frameworks are vital in determining the availability and effectiveness of crop insurance. Key aspects such as coverage extent, types of risks covered, and indemnity arrangements significantly influence farmers' decisions to adopt insurance. Effective regulations can enhance crop insurance provision by ensuring that policies are well-structured and accessible. For example, weather-indexed crop insurance has been demonstrated to improve food security by reducing food insecurity levels among insured farmers compared to those without coverage (Makhanova *et al*., 2024; Min-Che and Tung, 2024; Jianping *et al*., 2024; Saha, 2024). Such evidence underscores the importance of putting in place regulatory frameworks in designing insurance products that effectively meet farmers' needs and enhance their resilience. Traditional insurance regulations, which are typically designed for middle- and upper-income markets, often fail to meet the needs of low-income populations. These regulations can unintentionally limit access to insurance by favoring larger corporations and imposing barriers such as high capital requirements and complex policy specifications (Gupta and Sandu, 2023; Osifodunrin, 2023; Kaur, 2022; Thi Xuan Huong Le, 2023; Yu, 2021; Osifodunrin, 2022). To effectively support microinsurance, regulations must be tailored to address the unique challenges of low-income populations and facilitate broader access to affordable and accessible insurance options. Hence, the objective of this paper is to explore the regulatory framework governing crop insurance in Tanzania and analyze critically insurance regulations, including the main constraints in regulatory and supervisory practices.

Contextualizing Regulatory Landscape of Crop Insurance in Tanzania: The regulatory framework for crop insurance in Tanzania is overseen by the Tanzania Insurance Regulatory Authority (TIRA), established under the Insurance Act of 2009. This Act mandates TIRA to regulate all aspects of the insurance market, including crop insurance, to create a fair, efficient, and safe market for insured persons. TIRA's responsibilities include setting guidelines for insurance products, ensuring the solvency of insurers, protecting consumers, and defining the conditions for market entry and exit.

The Tanzania Insurance Act (2009) laid the groundwork for TIRA's establishment and delineated its supervisory role. It introduced a division between long-term and general insurers and encouraged the development of microinsurance. The Act supports the National Agricultural Policy (2013) and the Agricultural Sector Development Programme 2017/2018–2027/2028, highlighting the importance of crop insurance as a risk management tool.

The Tanzania Microinsurance Regulations (2013) were designed to make insurance more accessible to low-income households, including smallholder farmers. They facilitate the growth of inclusive insurance by setting up a framework for microinsurance, improving consumer education, and encouraging the development of insurance products that are affordable and accessible. However, challenges remain in implementing crop insurance due to limited institutional capacity and stakeholder coordination (UNDP, 2023).

Bancassurance Regulations (2019), established by TIRA and the Bank of Tanzania, allow banks to distribute insurance products, potentially increasing access to insurance through the extensive reach of banks' networks. This regulation could benefit smallholder farmers by providing insurance services through banking channels.

Despite these efforts, several regulatory gaps affect crop insurance availability and effectiveness: (i) *Lack of Crop Insurance specific regulations.* The Insurance Act and Microinsurance Regulations do not provide specific guidelines for crop insurance, leading to a reliance on insurers to manage risks and set premiums, which may widen the insurance gap for smallholder farmers (Rudramuni and Venkatesh, 2024). (ii) *Minimum Capital Requirements*. High capital requirements discourage insurers from offering crop insurance to low-income farmers. Large insurers are often unwilling to serve this market due to the low return on investments (Vasilenko, 2023: Churchill, 2007). (iii) *Management Requirements.* High qualifications for management roles in microinsurance organizations can deter potential leaders, limiting the growth of microinsurance providers (Rajeev and Nagendran, 2023). (iv) *Distribution Channels*. Current regulations primarily recognize the direct-provider model, excluding other potential distribution channels like community-based or cooperative societies, which could be more effective for reaching smallholder farmers (Glotova *et al*.,2024: Churchill, 2007). (v) *Insured Parties.* Regulations often favor covering commercial banks rather than the farmers themselves, creating a legal

loophole that limits direct benefits to smallholder farmers (Vasilenko, 2023) (vi) *Regulations on Business Lines and Agent Registration*. Restrictions on bundling life and non-life insurance and the lack of provisions for microinsurance companies limit market entry and the provision of tailored insurance solutions (Rajeev and Nagendran, 2023: Churchill, 2007). (vii) *Policy Details and Reporting Requirements.* Complex policy language and stringent reporting requirements can be prohibitive for low-income clients and small microinsurance operators (Churchill, 2007). (viii) *Reinsurance Constraints.* Microinsurance providers face challenges in accessing reinsurance, impacting their ability to offer comprehensive coverage (Churchill, 2007). (ix) *Claims Settlement*. The requirement for rapid claims settlement is often impractical, especially in remote areas with infrastructure challenges (Churchill, 2007).

Agricultural Development Theories and Crop Insurance: Smallholder theory in agriculture is based on the idea that small farms can be productive and contribute to food security and poverty reduction (Aina *et al*., 2024: Aheeyar *et al*., 2023). The theory emphasizes the crucial role of smallholder farmers in agricultural development. Smallholder farmers often face significant risks, including climate variability and market fluctuations, by providing them with the right inputs and skills, they can increase their productivity and income from their farming activities, leading to wider outcomes of agribusiness growth, enhanced food security, and rural development (Aina *et al*., 2024: Aheeyar *et al*., 2023). Crop insurance is vital for these farmers as it provides a safety net against such risks, enabling them to manage and mitigate potential losses. The theory suggests that by incorporating insurance as a key input, smallholder farmers can improve their resilience and productivity (Xie *et al*., 2023: Rudramuni and Venkatesh, 202).

The high Payoff Inputs Model advocates adopting high-yielding inputs to enhance agricultural productivity (Alia, 2017). When viewed as a high payoff input, crop insurance complements other productivity-enhancing technologies. It helps protect investments in high-yield crops from risks like droughts or floods, ensuring that the benefits of these inputs are realized. With climate change increasing the frequency of extreme weather events, integrating insurance with high payoff inputs becomes even more critical for sustaining agricultural development.

The impacts of climate change exacerbate the vulnerabilities of smallholder farmers. Increasingly erratic weather patterns and extreme events pose significant risks to crop production. Insurance can serve as a buffer against these uncertainties, enabling farmers to recover from losses and continue investing in their farms. Therefore, governments must support and modernize agricultural practices, including integrating crop insurance into broader agricultural strategies (Aina, 2024: Vijai *et al*, 2024: Abbas, 2024).

Governments must focus on modernizing agriculture to tackle the challenges of climate change and boost agricultural productivity. This involves improving infrastructure, adopting new technologies, and refining regulatory frameworks. Expanding and enhancing crop insurance schemes is vital for providing smallholder farmers with the necessary tools to manage risks and secure their livelihoods (Rajesh *et al*., 2024; Manju *et al*., 2024). Such modernization efforts should align with agricultural development theories, recognizing insurance as a critical component for managing risk and promoting sustainable growth in the sector (Aina *et al*., 2024; Rajesh *et al*., 2024; Manju *et al*., 2024). By investing in these areas, governments can help ensure agricultural advancements translate into tangible benefits for farmers.

Generally, while Tanzania's regulatory framework for crop insurance has made strides in recent years, significant improvements are needed to fully support smallholder farmers. Integrating insurance into agricultural development theories underscores its importance as a risk management tool, especially in the face of climate change. The government's role in modernizing agriculture and refining regulatory frameworks will be key to achieving these goals and ensuring that crop insurance effectively supports the country's agricultural development (Makhanova *et al*, 2024: Fu *et al*, 2024). Consequently, the objective of this paper is to review the regulatory framework and identifies challenges and opportunities in accessing insurance products among smallholder farmers in Tanzania.

MATERIALS AND METHODS

This research is predicated upon the systematic literature review (SLR) (refer to Fig 1), which has been articulated as a methodology for ensuring the integrity of evidence within reviews (Alatawi *et al*., 2023; Lu *et al*., 2022). Consequently, SLR methodologies were adhered to as established by preceding investigations within the domains of agriculture insurance studies. Initially, the research defined the eligibility criteria for both inclusion and exclusion predicated upon the overarching objective of the investigation (Alhossini *et al*., 2021; Ibrahim *et al*., 2022), which is to furnish insights regarding

microinsurance regulations. The research exclusively incorporated publications pertinent to agricultural insurance, particularly within the Tanzanian context. The Web of Science and Google Scholar were employed as the primary search engines, which provided comprehensive information related to agricultural insurance. The evaluation of the crop insurance regulatory framework in Tanzania was meticulously designed to ensure a comprehensive understanding of the subject. The primary objective was to gather and analyze scholarly sources, including academic papers, governmental publications, industry journals, and policy records, that are relevant to the Tanzanian context. The selection criteria focused on the relevance of the materials to crop insurance in Tanzania, their methodological rigor, and their currency. Both quantitative and qualitative research were considered to provide a holistic view of the regulatory environment and the status of crop insurance in the country. The sampling procedures involved a systematic search for literature using specific search terms such as "crop insurance regulation" and "the impact of regulation on crop insurance availability." This approach aimed to identify relevant studies and reports that could shed light on the regulatory issues and their effects on crop insurance uptake. Despite a thorough search, there was a noticeable scarcity of literature specifically addressing microinsurance regulation or the impact of regulations on microinsurance within the Tanzanian context. Most available texts contained only sections on insurance regulation rather than dedicated analyses of microinsurance. Data collection for this evaluation primarily involved a document review. This method was chosen for its ability to provide a broad overview of existing knowledge and identify gaps in the current understanding of crop insurance regulation. The review process was rigorous, focusing on scholarly papers, government reports, and policy documents that directly pertain to crop insurance in Tanzania. The content analysis technique was employed to systematically interpret the information gathered from the reviewed documents. The analysis process began with the transcription of key contents from the selected papers, which were then examined to identify recurring themes and patterns. This approach allowed for a structured extraction of significant findings and insights related to crop insurance regulation and its implications. The themes for the document review were as follows:

Regulatory Framework and Its Impact-This theme focused on how existing regulations influence the availability and accessibility of crop insurance in Tanzania. It highlighted the gaps and challenges within the regulatory framework and its effect on smallholder farmers' ability to adopt insurance.

Determinants of Crop Insurance Adoption-This theme examined the factors that influence the adoption of crop insurance in Tanzania. It included aspects such as farmers' perceptions, economic barriers, and the influence of regulatory policies on insurance uptake.

Microinsurance and Policy Gaps-This theme addressed the specific issues related to microinsurance regulation. There is a need for targeted regulatory measures to support this segment of the insurance market. The integration of these themes provided an understanding of the regulatory environment and its impact on crop insurance. By synthesizing the findings, the evaluation offered actionable insights and recommendations for improving crop insurance regulations and enhancing their effectiveness in supporting smallholder farmers in Tanzania.

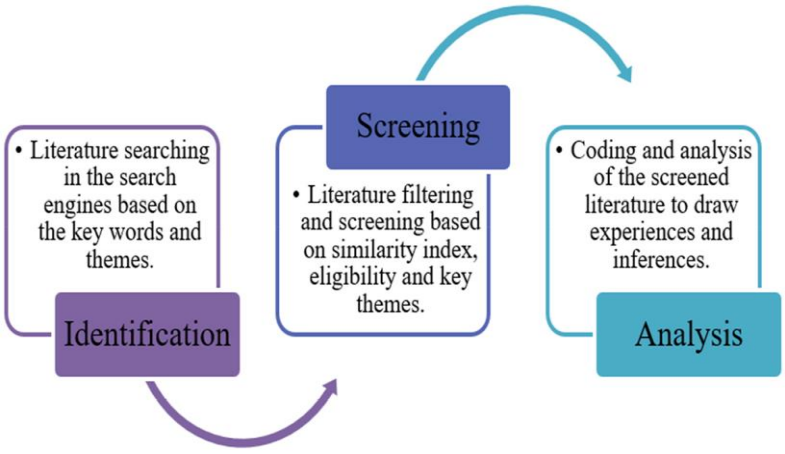

Fig. 1: The SLR process
Source: Adopted from Mchopa *et al*, (2024)

RESULTS AND DISCUSSION

Challenges in implementing agriculture insurance in Tanzania: Implementing agriculture insurance in Tanzania faces several significant challenges that hinder its effectiveness and uptake among farmers. These challenges stem from socioeconomic factors, regulatory issues, and the nature of the insurance products themselves.

Premium Penetration and Adoption: Crop insurance in Tanzania has demonstrated slow progress, with current premium penetration at just 0.02% (TIRA, 2023; UNDP, 2023). Despite various experimental initiatives and the introduction of microinsurance regulations in 2013, the uptake remains limited. Factors contributing to this include high transaction costs, limited understanding and awareness among farmers, and low demand. The gradual progression of crop insurance, alongside the implementation of multiple pilot projects, reflects an initial enthusiasm that has yet to translate into widespread adoption.

Microinsurance Initiatives: Several pilot and full-scale projects have been launched under the microinsurance framework, covering a range of crops such as maize, cassava, and beans. However, many of these projects have struggled to expand due to financial constraints, infrastructural deficiencies, and insufficient farmer education. The lack of a comprehensive understanding of insurance principles among stakeholders and high operational costs have impeded the effectiveness and growth of these initiatives (Joab and Recha,2019; Machangu, 2023).

Regulatory and Institutional Constraints: Despite regulatory advancements, several challenges remain. High minimum capital requirements, stringent regulations on key management, and limited distribution channels hinder the entry and operation of microinsurance providers. These barriers disproportionately affect smallholder, locally organized microinsurance institutions and limit their ability to offer affordable and accessible insurance products to smallholder farmers (URT, 2009: URT, 2013: UNDP, 2023).

Case studies from East African countries that have successfully implemented crop insurance: The Government of Rwanda launched the National Agriculture Insurance Scheme (NAIS) in April 2019 under the title "Tekana Urishingiwe Muhinzi Mworozi" ("Smallholder farmer, feel safe, you are insured")." The program is implemented by working with Rwanda's premier private insurance companies, the NAIS is developing financially viable insurance products coupled with a 40% subsidy from The Ministry of Agriculture and Animal Resources (MINAGRI) to manage risks and losses in crops and livestock. The Government of Uganda has been implementing The Uganda National Insurance Scheme (UAISI) since 2016 which is a public-private partnership between the Government of Uganda and farmers, it is aimed at mitigating financial losses suffered by farmers as a result of damage and destruction of their crops and livestock due to Fire, Drought, Flooding, Landslides, Hailstorm damage, Windstorm damage, Malicious damage, Riots & strikes, and uncontrollable pests and diseases. The program provides participation incentives and subsidies for participation, including subsidies and VAT exemptions on insurance premiums.

In 2015 the Government of Kenya started implementing the Kenya Agricultural Insurance Program (KAIP) – Crop Insurance Sub Program (K-CIP): 2015 which is implemented through National government and County governments as well as the Agricultural Insurance Pool of Insurers, with support from Kenya's Insurance Regulatory Authority (IRA). The programme offers incentives such as Subsidy; and regulatory exemptions.

Whereas agricultural insurance is gaining increasing attention in East Africa as a promising tool for adapting smallholder agriculture to climate risk, there are common features to the success of all the programs identified which are comprehensive sensitization/awareness creation, building local capacity, integrating insurance in other interventions, and participatory designing of insurance products. The models used in the cases are index insurance bundling with agricultural credit and/ or farm inputs, coupled with government support through policies and subsidies in public-private partnerships

Regulatory challenges for crop insurance: Regulatory barriers to crop insurance in Africa are complex and varied, influencing the uptake and efficiency of agricultural insurance programs. Principal concerns encompass deficient regulatory structures, restricted availability of financial services, and inadequate data quality. Such obstacles impede the formulation of resilient insurance products specifically designed to meet the needs of smallholder farmers, thereby ultimately compromising their capacity to withstand agricultural risks (Ntukamazina *et al.,* 2017).

Recently, we have witnessed some improvements in the provision of crop insurance. However, regulatory barriers still exist in these countries as the regulatory framework for crop insurance is still in its developmental stages, which creates a lack of clarity

for insurers, farmers, and other stakeholders. While there are general insurance laws, they do not sufficiently address the specific complexities of agricultural insurance, including crop insurance. The absence of a specialized regulatory framework hinders the development of products tailored to farmers' needs and limits the effective oversight of insurance schemes. An analysis of Kenya, Uganda, and Rwanda, shows crop insurance faces significant regulatory challenges that affect its effectiveness and adoption as described herein.

While some government-subsidized programs exist in East African countries, such as the Kenya Agriculture Insurance Program (KAIP), Tanzania Agricultural Insurance Scheme (TAIS which is yet to roll on), Uganda Agricultural Insurance Scheme (UAIS), and National Agricultural Insurance Scheme in Rwanda (NAIS), these efforts are not widespread enough to significantly lower premiums or cover all farmers. Moreover, the lack of a comprehensive regulatory approach for scaling subsidies across the country limits the impact of these initiatives. Regulatory frameworks that support wider subsidy programs and public-private partnerships are necessary to make premiums affordable (Reyes et al., 2017: Ntukamazina *et al.*, 2017: Breisinger *et al*, 2024; IFPRI, 2024).

Effective crop insurance requires reliable data on weather patterns, crop yields, and agricultural risks. In these countries, the data infrastructure is still underdeveloped. Regulatory challenges arise from the lack of coordination between government agencies, insurers, and agricultural stakeholders to build a comprehensive database. This data gap hampers accurate risk assessments, leading to higher premiums and inefficient insurance product designs. The regulatory system lacks strong mandates for data sharing and collaborative frameworks to develop the required infrastructure (Breisinger *et al*, 2024: Ntukamazina *et al*., 2017; Reyes *et al.*, 2017).

Crop insurance penetration remains low, especially among smallholder farmers who are often unaware of the existence or benefits of such insurance schemes. Regulatory bodies have not fully mandated or facilitated extensive farmer education programs, which are crucial to enhancing uptake. Farmers are often unfamiliar with the technicalities of insurance products, leading to mistrust and reluctance to participate. A stronger regulatory focus on consumer education and protection is needed to ensure farmers fully understand the products available and can make informed decisions (Ntukamazina *et al*., 2017: TIRA, 2023: Breisinger *et al*, 2024).

Weather index-based insurance (WIBI), which is commonly used, faces regulatory and operational hurdles. WIBI is designed to trigger payouts based on predetermined weather conditions (e.g., rainfall or temperature levels). Still, it often results in basis risk, where actual crop losses do not correspond to the insurance payout. The regulatory framework lacks sufficient guidelines to address such basis risks or establish clear dispute resolution mechanisms. This undermines farmer confidence in insurance products and limits the adoption of WIBI schemes (Guo and Li, 2024: Negi and Ramaswami, 2024 Ntukamazina *et al.*, 2017). To address these issues, innovative approaches like neural network-based optimization can enhance the design of WIBI contracts, reducing basis risk and improving utility for farmers (Chen *et al*., 2023).

Public-private partnerships (PPPs) are essential for crop insurance to function effectively, especially in offering premium subsidies, product distribution, and risk-sharing. However, countries' regulatory frameworks do not provide enough incentives or structured support to encourage effective partnerships between the government, private insurers, and other stakeholders. Regulatory gaps in managing PPPs mean that these collaborations often lack the coherence and coordination needed to scale and sustain crop insurance programs ((Lodhi and Shah, 2024: Ntukamazina *et al*., 2017).

The Insurance Regulatory Authorities have limited capacity to oversee the complexities of crop insurance. This lack of capacity results in inconsistent enforcement of regulations and standards, which weakens the overall regulatory environment. The regulators' limited experience with agricultural insurance products also means that there is inadequate oversight over the design, implementation, and performance of crop insurance products. Strengthening the regulatory capacity to regulate agricultural insurance is critical for ensuring that crop insurance markets grow sustainably (Makhanova *et al*, 2024: Glotova *et al*, 2024: Ntukamazina *et al*., 2017).

There is often a lack of coordination between different regulatory bodies, such as the Ministries of Agriculture, the Insurance Regulatory Authorities, and private sector actors. This fragmented approach results in inefficiencies, with overlapping responsibilities and gaps in service delivery. Without a cohesive regulatory approach, it becomes difficult to address systemic issues such as data sharing, subsidy management, and product standardization. Effective coordination mechanisms within the

regulatory framework are needed to integrate the efforts of all stakeholders involved in crop insurance (Makhanova *et al*., 2024: Ntukamazina *et al*., 2017).

African countries are highly vulnerable to climate change, which increases the frequency and severity of droughts, floods, and other extreme weather events. The current regulatory frameworks do not sufficiently address climate risks in their planning or implementation. Insurance products must be updated to reflect the changing risk landscape, and this requires a regulatory approach that promotes innovation in climate risk management. There is a need for forward-looking policies that encourage climate-smart insurance products, such as integrating disaster risk management into crop insurance schemes (Chen *et al*, 2024: Ntukamazina *et al*., 2017).

Currently, there is no regulatory framework that standardizes the design and terms of crop insurance products. Different insurers offer varying terms and conditions, which can confuse farmers and lead to a lack of trust in the system. Regulatory bodies should consider establishing minimum standards for crop insurance policies, including clear definitions of covered risks, payout mechanisms, and transparency in premium calculations. This would enhance fairness and transparency, making it easier for farmers to compare and choose appropriate products (Makhanova *et al.*, 2024: Ntukamazina *et al*., 2017).

Emerging Themes in Crop Insurance Regulation: The analysis of available literature and regulatory documents has revealed key themes affecting crop insurance in Tanzania: (a) *Regulatory Framework and Implementation.* The evolving regulatory landscape, including recent policy initiatives, impacts the effectiveness and reach of crop insurance as it advocates for agricultural risk management through insurance. (b) *Accessibility and Affordability*. High costs and complex regulations restrict the accessibility of insurance for low-income farmers. (c) *Government and Stakeholder Collaboration.* Efforts from the government and various stakeholders are crucial for improving insurance uptake and addressing existing challenges.

These findings highlight the complex interplay between regulatory frameworks, market dynamics, and the practical challenges faced by smallholder farmers in Tanzania. Addressing these issues requires a multifaceted approach, including regulatory reform, enhanced financial literacy, and better-designed insurance products to improve the resilience of the agricultural sector under climate change.

Conclusion: Enhancing agriculture resilience to natural disaster risks among smallholder farmers in Tanzania is crucial for sustaining food security and rural livelihoods. Crop insurance has the potential to be a powerful tool in mitigating the impacts of disasters such as droughts, floods, and pests. This can be achieved by addressing regulatory challenges by ensuring regulatory frameworks are simplified by reducing capital requirements and easing management regulations, allowing more microinsurance providers to enter the market. Increasing farmer education through targeted awareness campaigns and training programs can help raise demand for crop insurance. Additionally, investing in infrastructure and expanding distribution channels, such as partnerships with local organizations and cooperatives, can enhance the accessibility of insurance services. Finally, developing innovative, tailored insurance products that are affordable and designed to meet the specific needs of smallholder farmers is crucial for increasing their resilience to natural disasters and climate-related agricultural risks.

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