



Factors Affecting Farmers' Willingness to Pay for Agricultural Insurance: A Literature Survey (2004-2023)

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ABSTRACT

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Agriculture is a critical component of many economies, and the livelihood of farmers is often highly dependent on their ability to manage crop and livestock production risks. This study provides a comprehensive synthesis of the existing literature, shedding light on the intricate dynamics shaping farmers' decisions to invest in agricultural insurance. Based on the literature survey made for 54 relevant research studies (conducted between 2004 and 2023), this study presents an extensive review of research on factors affecting farmers' willingness to pay for livestock insurance. The study aggregates and analyzes findings from many sources, offering valuable insights for policymakers, insurance providers, and researchers. The study's findings inform the design of targeted interventions and awareness campaigns to enhance the financial protection of farmers, ensuring their stability in the face of economic and climatic uncertainties. In this way, the findings are significant in the context of global agricultural resilience and food security.



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1. Introduction

The research landscape on farmers' willingness to invest in agricultural insurance is marked by a diverse array of studies that delve into an extensive range of factors influencing this critical decision. Examining the demographic and socioeconomic dimensions, numerous studies affirm the hypothesis that advanced age positively affects farmers' propensity to purchase insurance, highlighting the correlation between greater life experience and risk aversion (Adjabui, Tozer, & Gray, 2019; Akintunde, 2015). However, it's essential to acknowledge a body of research that offers contrasting findings, suggesting that age can also be negatively correlated with willingness to invest in insurance, possibly due to the financial

constraints and obligations that come with age(Abebe & Bogale, 2014; Aina, Ayinde, Thiam, & Miranda, 2018). Similarly, gender emerges as a variable of interest, with some studies revealing that male farmers are more likely to invest in agricultural insurance, while others report positive gender-based associations (Adjabui et al., 2019; Budhathoki, Lassa, Pun, & Zander, 2019).

Educational attainment emerges as a robust determinant, corroborating the hypothesis that higher levels of education are positively associated with farmers' willingness to invest in insurance. These findings emphasize the pivotal role of knowledge and information in shaping insurance decisions, underlining the importance of education in increasing awareness and understanding of insurance mechanisms (Aina et al., 2018; Akintunde, 2015).

Conversely, there exists a parallel stream of research indicating that education can have a negative impact, suggesting that highly educated individuals may possess more financial acumen and are thus more likely to assess the cost-benefit trade-offs differently (Arshad, Amjath-Babu, Kächele, & Müller, 2016; Kwadzo, Kuwornu, & Amadu, 2013). This dichotomy underscores the need to explore the multifaceted interactions between educational backgrounds and insurance decisions, considering the unique contexts and conditions under which these decisions are made. In a similar vein, household size and marital status introduce a nuanced dimension to the discourse, with both positive and negative associations reported in various studies, reflecting the complex interplay of familial dynamics and insurance preferences (Danso-Abbeam, Addai, & Ehiakpor, 2014; Madaki, Kaechele, & Bavorova, 2023).

1.1. Significance of the Study

Understanding the multifaceted factors that drive farmers' decisions to invest in agricultural insurance is paramount. This research seeks to contribute to the existing body of knowledge by comprehensively analyzing the diverse variables that influence farmers' willingness to participate in insurance programs. Such insights can guide policymakers, insurance providers, and development agencies in tailoring strategies that promote insurance adoption among agricultural communities.

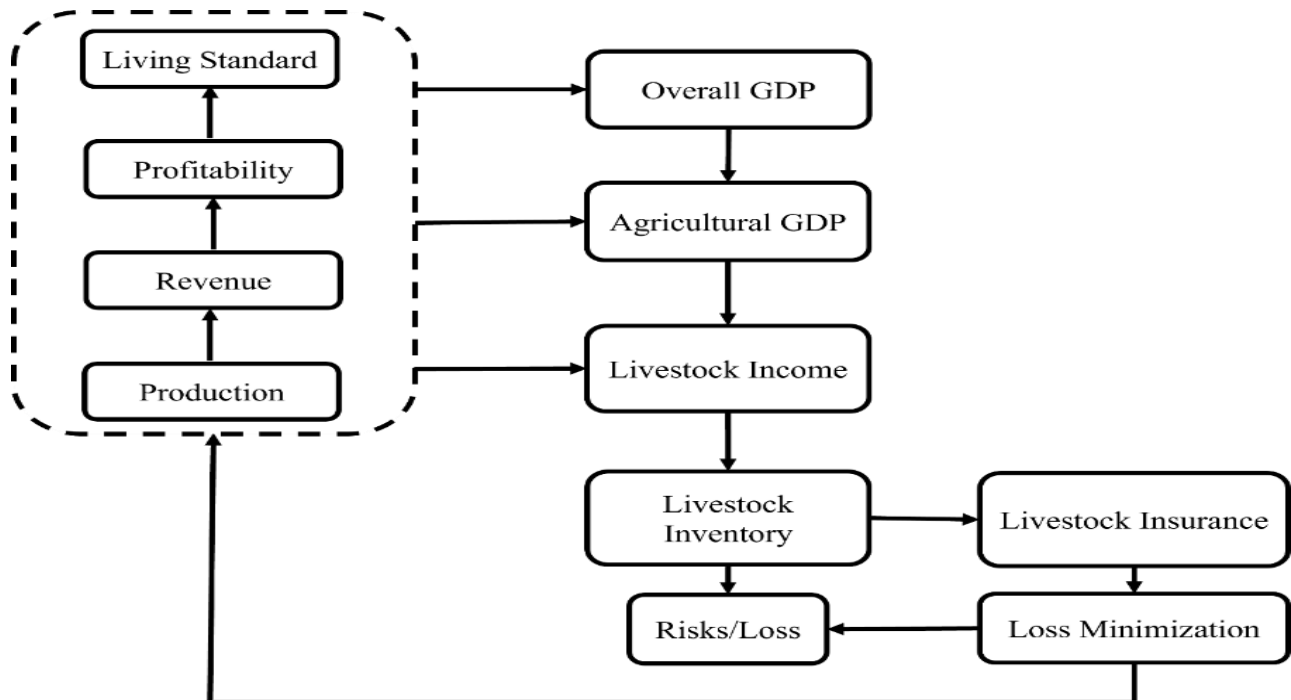


Figure 1: Micro & Macro Economic Implications of Livestock Insurance

1.2. Economic Implications of Livestock Insurance

Livestock insurance can have both microeconomic and macroeconomic implications, particularly in the context of loss minimization.

1.3. Microeconomic Implications of Livestock Insurance

Livestock insurance helps individual farmers reduce the financial risks associated with livestock losses due to various reasons such as disease, accidents, or natural disasters. This protection allows farmers to maintain a more stable income. Insurance payouts can cover the economic losses in case of livestock losses, ensuring that the household's financial stability is maintained. This stability allows for better planning and investment in the farm. Farmers may be more inclined to invest in improving their livestock, such as purchasing higher-quality breeds or implementing better healthcare practices, knowing that their investments are protected by insurance. This can lead to improved livestock productivity and income.

Livestock insurance can reduce the need for borrowing, preventing the accumulation of debt and its associated negative economic impacts. By minimizing the financial shocks that farmers face due to livestock losses, insurance can contribute to overall agricultural growth. It provides security, encouraging farmers to expand their livestock-related activities and engage in riskier but potentially more profitable endeavors.

1.4. Macroeconomic Implications of Livestock Insurance

Livestock insurance can contribute to the stability of the agricultural sector by reducing the volatility in farmers' incomes. A stable agricultural industry is essential for food security and overall economic stability. With insurance in place, farmers are more likely to invest in livestock improvement, leading to increased productivity. This, in turn, can boost the overall supply of livestock products, potentially leading to lower consumer prices and economic growth. Increased agricultural productivity, driven by the availability of livestock insurance, can lead to job creation within the agriculture and related sectors.

This can have a positive impact on overall employment and economic growth. In natural disasters or disease outbreaks, livestock insurance can reduce the financial burden on governments by enabling the private sector to handle compensation for losses. A well-functioning livestock insurance sector can enhance investor confidence in agriculture. Investors may be more willing to fund agricultural projects and ventures when they see a system in place to protect against unexpected losses.

This study is particularly significant in the context of global agricultural resilience and food security. The findings can inform the design of targeted interventions and awareness campaigns to enhance the financial protection of farmers, ensuring their stability in the face of economic and climatic uncertainties. Moreover, it has the potential to foster sustainable agricultural practices, contributing to the economic growth of rural areas and safeguarding the livelihoods of countless farming households.

1.5. Limitations of the Study

Despite the robustness of this research, it is essential to acknowledge certain limitations. First, the study draws from existing literature, which may vary in methodology and context. This heterogeneity could affect the generalizability of the findings. Secondly, the study predominantly relies on cross-sectional data from various sources, limiting the ability to establish causality. Additionally, the multifaceted nature of the determinants explored in this research introduces

the possibility of the interplay between these factors, which may not be fully captured within the scope of the study. Finally, while the literature reviewed encompasses a broad range of geographic locations, certain regions and local contexts may not be adequately represented.

The limitations notwithstanding, this study provides a comprehensive synthesis of the existing literature, shedding light on the intricate dynamics shaping farmers' decisions to invest in agricultural insurance. The insights gleaned from this research can serve as a foundation for future studies and inform targeted policies to enhance the financial resilience of agricultural communities.

1.6. Research Hypotheses

The literature highlights that combining the following factors often determines farmers' decisions to invest in agricultural insurance, emphasizing the need for holistic and context-specific approaches to promote insurance adoption in agricultural communities. Several studies have examined the impact of different kinds of variables on farmers' insurance decisions.

- H₁:** Farmer's levels of education positively affecting farmers' willingness to invest in insurance
- H₂:** Farm income has a positive influence on the likelihood of insurance adoption
- H₃:** Larger herds positively impact farmers' decisions regarding livestock insurance
- H₄:** Specific breed types can lead to higher investment in livestock insurance
- H₅:** Farmers who practice intercropping are more willing to invest in insurance
- H₆:** Farmers' awareness with the existence and benefits of agricultural insurance products positively influences the adoption
- H₇:** Lower premium costs are more attractive to those willing to invest in insurance
- H₈:** Farmers' perception of risk and their trust in insurance mechanisms play a crucial role in their decision to invest in insurance
- H₉:** The local climate (temperature, rainfall, and climate patterns) affect farmers' decisions to invest in insurance
- H₁₀:** Crop diversification positively impacts farmers' willingness to invest in crop insurance

2. Methodology

A comprehensive literature search was conducted, covering studies from 2004 to 2023. The identified studies were categorized based on factors influencing farmers' willingness to pay for livestock insurance. The research findings were synthesized and analyzed to highlight common trends and discrepancies. Factors that positively or negatively impacted willingness to pay were identified, providing a nuanced view of the complex landscape of agricultural insurance adoption.

The study focuses on the following factors as the determinants of farmer's willingness to pay for adopting livestock insurance. The characteristics of each of the factors are given below:

1. **Demographic and Socioeconomic Factors:** includes age, gender, and education of the farmer as well as marital status of the farmers
2. **Agriculture and Farming-Related Factors:** include intercropping, gross income, and farm assets
3. **Farm-Specific Factors:** encompasses farmland size, farm diversification, and land tenure status
4. **Livestock-Specific Factors:** focusing on herd size, livestock ownership, and breed of animals
5. **Crop-Specific Factors:** includes crop diversification, loss experience, access to service
6. **Insurance-Related Factors:** are awareness, premium costs, the role of insurance companies and agents

- 7. Social and Community Factors:** group membership, accessibility to credit, and government assistance
- 8. Financial Factors:** are access to credit, risk aversion, and savings and borrowings
- 9. Geographic and Location-Based Factors:** includes farm location, weather information, and distance to key resources
- 10. Psychological and Attitudinal Factors:** risk perception, attitude, response efficiency
- 11. Environmental Factors:** includes meteorological information, natural calamities (drought and flood)

3. Results and Discussion

Following an extensive review of the literature focusing on the variables influencing farmers' willingness to pay for livestock insurance, which included research conducted from 2004 to 2023, the elements found are combined, examined, and grouped into the following topics. Additionally, each factor's attributes are listed in this section.

3.1. Demographic and Socioeconomic Factors

Previous literature indicates that the age of farmers had a beneficial influence on their willingness to pay for livestock insurance in 15 investigations (Adjabui et al., 2019; Akintunde, 2015; Ali, 2013; Danso-Abbeam et al., 2014; Dong, Jimoh, Hou, & Hou, 2020; Ghazanfar, Wen, Abdullah, Ahmad, & Khan, 2015; Indra, Ula, & Nugroho, 2023; Jimoh Ibitoye, 2012; Kurniaty, Masyhuri, & Jamhari, 2021; Liu, Hou, Li, Min, & Mu, 2021; Manja, Chirwa, & Kambewa, 2015; Mensah et al., 2023; Musonda, 2012; Shang & Xiong, 2021; Teweldemedhin & Kafidi, 2009), while these 19 research revealed that older farmers were less likely to pay for livestock insurance, it was not clear why this was the case. (Abebe & Bogale, 2014; Aina et al., 2018; Amin, Abdullahi, Suryani, & Alias, 2014; Arshad et al., 2016; Dahal, Adhikari, & Khanal, 2022; Hill, Hoddinott, & Kumar, 2013; Kwadzo et al., 2013; Madaki et al., 2023; Mahboob, Rehman, Hamid, & Saeed, 2019; Mbonane & Makhura, 2018; Mutaqin & Usami, 2019; Nugrahaini, Masyhuri, & Suryantini, 2021; Oduniyi, Antwi, & Tekana, 2020; Ramasubramanian, 2012; Sadati et al., 2010; Sami, 2017; Singh, 2017; Sujarwo, 2017; Xiu, Xiu, & Bauer, 2012).

These 8 studies found a negative effect of sex/gender on WTP for agriculture insurance "(Akintunde, 2015; Budhathoki et al., 2019; Danso-Abbeam et al., 2014; Dong et al., 2020; Liu et al., 2021; Mbonane & Makhura, 2018; Nyaaba, Nkrumah-Ennin, & Anang, 2019; Xiu et al., 2012)" while had positive impact on WTP for insurance in several studies such as (Adjabui et al., 2019; Dahal et al., 2022; Hill et al., 2013; Jimoh Ibitoye, 2012; Madaki et al., 2023; Manja et al., 2015; Mensah et al., 2023; Mutaqin & Usami, 2019; Otieno, Oluoch-Kosura, Karugia, Drucker, & Rege, 2006; Teweldemedhin & Kafidi, 2009).

The educational status of a farmer could also affect the WTP for livestock insurance. The more the chances to be willing to insure, the more educated the farmer is. Education positively influenced the propensity of farmers to pay for livestock insurance, according to these 23 studies "(Aina et al., 2018; Akintunde, 2015; Ali, 2013; Danso-Abbeam et al., 2014; Dong et al., 2020; Ellis, 2016; Ghazanfar et al., 2015; Gulseven, 2020; Indra et al., 2023; Jimoh Ibitoye, 2012; Kurniaty et al., 2021; Madaki et al., 2023; Manja et al., 2015; Mehmood, Ullah, e Ali, Baber, & Ashraf, 2022; Mohammed & Ortmann, 2005; Musonda, 2012; Mutaqin & Usami, 2019; Nugrahaini et al., 2021; O'Reilly, Bishu, Lahiff, & Gebregziabher, 2018; Sami, 2017; Singh, 2017; Suharyanto, Ansyor, & Hidayat, 2021; Sujarwo, 2017)" whereas 13 studies have demonstrated a negative correlation between education and farmers' "willingness to pay for livestock insurance (Adjabui et al., 2019; Arshad et al., 2016; Dahal et al., 2022; Khan, Chander, & Bardhan, 2013; Kwadzo et al., 2013; Mahboob et al., 2019; Mbonane & Makhura, 2018; Mensah et al., 2023; Nyaaba et al., 2019; Oduniyi et al., 2020; Shang & Xiong, 2021;

Teweldemedhin & Kafidi, 2009; Xiu et al., 2012)". Sadati et al. (2010) found a positive effect of literacy on the adoption of crop insurance.

Literature has also highlighted the role of household size as a determinant of WTP for livestock insurance. According to the literature review, household size had negative impact on WTP for agriculture insurance in 11 studies (Adjabui et al., 2019; Chand, Kumar, Bhattarai, & Saroj, 2016; Danso-Abbeam et al., 2014; Gulseven, 2020; Mensah et al., 2023; Musonda, 2012; Nugrahaini et al., 2021; Nyaaba et al., 2019; Ramasubramanian, 2012; Sadati et al., 2010; Sami, 2017) while had positive impact on WTP for insurance in 14 studies (Aina et al., 2018; Akintunde, 2015; Ali, 2013; Arshad et al., 2016; Budhathoki et al., 2019; Jimoh Ibitoye, 2012; Kwadzo et al., 2013; Liu et al., 2021; Madaki et al., 2023; Mbonane & Makhura, 2018; Mehmood et al., 2022; Shang & Xiong, 2021; Subedi & Kattel, 2022; Sujarwo, 2017).

According to these five studies "Adjabui et al. (2019); Liu et al. (2021); Mbonane and Makhura (2018); Mehmood et al. (2022); Oduniyi et al. (2020)" there was an inverse relationship between being married and willingness to pay for health insurance., whereas the marital status of a farmer as 'married' had positive effect on WTP for insurance in some studies "(Aina et al., 2018; Danso-Abbeam et al., 2014; Ellis, 2016; Jimoh Ibitoye, 2012; Mensah et al., 2023)". Family type (joint family) is reported as being positively impacting the WTP for insurance in two studies (Dahal et al., 2022; Mehmood et al., 2022) while being negatively influencing the WTP for insurance in a study (Ali, 2013). The number of dependent family members had positive (Oduniyi et al., 2020) and negative effects on farmers' WTP for insurance (Kurniaty et al., 2021; Oduniyi et al., 2020). The amount of religiosity was found to have a negative impact on willingness to pay for insurance in a study, as indicated by (Mehmood et al., 2022).

Nearly 17 studies (Abebe & Bogale, 2014; Ali, 2013; Arshad et al., 2016; Budhathoki et al., 2019; Ghazanfar et al., 2015; Gulseven, 2020; Jimoh Ibitoye, 2012; Kurniaty et al., 2021; Mahboob et al., 2019; Mensah et al., 2023; Musonda, 2012; Nugrahaini et al., 2021; O'Reilly et al., 2018; Otieno et al., 2006; Sadati et al., 2010; Shang & Xiong, 2021; Subedi & Kattel, 2022) have reported the positive effect of income or farm income on WTP for agricultural insurance, while only two studies (Ellis, 2016; Mehmood et al., 2022) in contrast.

3.2. Agriculture and Farming-Related Factors

According to the literature review, they were intercropping positively impacted WTP for insurance (Mehmood et al., 2022). Gross income, getting other types of insurance, and being active in a farmer's group all made people more likely to pay for agriculture insurance (Sujarwo, 2017). The number of family members involved in agriculture positively impacted WTP for insurance (Dahal et al., 2022). Farm assets positively impacted willingness to insure (Olubiyo, Hill, & Webster, 2009). The amount of debt that farmers carry has a detrimental effect on their willingness to pay for insurance (Mehmood et al., 2022). Non-farm income had an adverse impact on adoption of agriculture insurance (Abebe & Bogale, 2014; Ali, 2013; Singh, 2017) while positive effect on WTP for insurance in eight studies (Adjabui et al., 2019; Arshad et al., 2016; Gulseven, 2020; Kwadzo et al., 2013; Mehmood et al., 2022; Musonda, 2012; Nyaaba et al., 2019; Ramasubramanian, 2012).

A smart smartphone was positively associated with WTP for livestock insurance (Liu et al., 2021). Similarly, radio ownership positively impacted the willingness to pay for subsidized farm inputs (Manja et al., 2015). In another study, radio ownership had a positive and public and private gift had a negative impact on willingness to pay value (Abebe & Bogale, 2014).

Primary/major occupation had a positive (Ellis, 2016), although it adversely affected the WTP of producers for crop insurance (Adjabui et al., 2019). According to the findings of Adjabui et al. (2019), the revenue obtained from maize had a beneficial impact on the desire of farmers

to enroll in crop insurance. According to Nugrahaini et al. (2021) the amount of income generated from cattle had a negative effect on the participants' willingness to pay for insurance on their animals.

3.3. Farm-Specific Factors

Some studies argued that the amount of farming experience a farmer had a negative impact on their willingness to pay (WTP) for agricultural insurance, i.e. (Mbonane & Makhura, 2018; Mohammed & Ortmann, 2005) while it had a positive effect on WTP for insurance in 17 studies (Akintunde, 2015; Amin et al., 2014; Dahal et al., 2022; Ellis, 2016; Khan & Khan, 2006; Kurniaty et al., 2021; Madaki et al., 2023; Mensah et al., 2023; Musonda, 2012; Mutaqin & Usami, 2019; Nugrahaini et al., 2021; Nyaaba et al., 2019; Oduniyi et al., 2020; Sadati et al., 2010; Sherrick, Barry, Ellinger, & Schnitkey, 2004; Singh, 2017; Suharyanto et al., 2021). The rice farming experience had a negative impact on farmers' willingness to pay (WTP) for insurance premiums in Indonesia (Indra et al., 2023). At the same time, farmer experience had an adverse impression on TLUs willing to insure in the North West of South Africa (Oduniyi et al., 2020).

The literature research indicates that there is a negative correlation between farm size or agricultural area and willingness to pay (WTP) for agriculture insurance (Madaki et al., 2023; Musonda, 2012; Nyaaba et al., 2019) whereas had positively been related to WTP for insurance in 16 studies (Ali, 2013; Amin et al., 2014; Budhathoki et al., 2019; Chand et al., 2016; Dahal et al., 2022; Danso-Abbeam et al., 2014; Jimoh Ibitoye, 2012; Khan & Khan, 2006; Kwadzo et al., 2013; Manja et al., 2015; Mehmood et al., 2022; Olubiyo et al., 2009; Sami, 2017; Shang & Xiong, 2021; Sherrick et al., 2004).

Land area positively impacted the adoption of agriculture insurance in two studies (Gulseven, 2020; Sujarwo, 2017). It was found that crop/agriculture insurance had a detrimental effect on willingness to pay (WTP) (Indra et al., 2023). The influence of medium-sized crops on willingness to purchase crop insurance in Eastern Ghana was negative, while the impact of large-sized crops was favorable (Ellis, 2016).

Farm diversification had a negative impact on farmers' willingness to pay for crop insurance in three studies (Adjabui et al., 2019; Ali, 2013; Mohammed & Ortmann, 2005). The land ownership status of the proprietor has a favorable influence on farmers' willingness to pay (WTP) for crop insurance in Ghana (Adjabui et al., 2019). Expected production next year is associated with farmers' willingness to pay for crop insurance in Indonesia (Mutaqin & Usami, 2019).

3.4. Livestock -Specific Factors

Herd size, according to the literature review, had negative impact on WTP for agriculture insurance in two studies (Abebe & Bogale, 2014; Akintunde, 2015) while positively related to WTP for insurance in seven studies (Dong et al., 2020; Ghazanfar et al., 2015; Madaki et al., 2023; Mehmood et al., 2022; Nugrahaini et al., 2021; Subedi & Kattel, 2022; Xiu et al., 2012). Likewise, livestock ownership was found to be negatively affecting the adoption of agriculture insurance in a study (Madaki et al., 2023).

According to the literature review, extension participatory, literacy, agrarian land, number of land pieces, and dry lands have encouraged crop insurance adoption (Sadati et al., 2010).

According to the literature review, farmer's interests positively impact WTP for cattle insurance (Nugrahaini et al., 2021). The willingness to pay for insurance was positively influenced by asset ratios of agricultural equity (Sherrick et al., 2004). Access to loans positively impacted

cattle insurance in Nepal (Subedi & Kattel, 2022). In Eswatini, the willingness to pay for insurance was increased as a direct result of increased farm turnover (Singh, 2017).

Breed of the animals also affects the decision of insurance. Cross/exotic breed and value of cattle had a positive while zebus breed had a negative impact on WTP for livestock insurance in Western Kenya (Otieno et al., 2006). Similarly, the type of cow breed had a constructive effect on the market for cattle insurance in Nepal (Subedi & Kattel, 2022). In the Indian states of Haryana and Rajasthan, a higher milk yield positively impacted insurance payments (Chand et al., 2016).

3.5. Crop-Specific Factors

In the case of Pakistan, a person's willingness to pay for crop insurance was positively influenced by crop diversity, risk exposure, and loss (crops), while it was negatively impacted by predicted yield and livestock (Ghazanfar et al., 2015). According to previous research, farmers interested in crop insurance in Swaziland had a negative influence due to last loss experiences (Mbonane & Makhura, 2018). Access to services had a negative effect on the willingness to pay for flood insurance of crops in Pakistan (Arshad et al., 2016).

Improved seed, fertilizer, and value addition were positive, while agrochemicals negatively impacted willingness to insure in Nigeria (Olubiyo et al., 2009). Value added positively impacted willingness to insure one study (Schmidt & Bijmolt, 2020). The number of beehives positively impacted the adoption of insurance (preference) for apiculturists in Ghana (Mensah et al., 2023).

According to the relevant literature, off-farm investments and the farm's location had a negative impact on WTP for insurance in Eritrea, whereas information had a good effect on WTP (Mohammed & Ortmann, 2005). According to previous research, the number of people who are permanently working on the farm, as well as the occurrence of damage to the farm in the past, have a beneficial impact on the decision to purchase subsidized insurance in Poland (Kurdys-Kujawska & Sompolska-Rzechula, 2018).

3.6. Insurance-Related Factors

Awareness of agriculture insurance is essential for farmers to understand its potential benefits and coverage for their crops and livestock. Increased awareness can increase participation and enrollment rates in agricultural insurance programs, ultimately improving farmers' resilience to unexpected losses. Awareness had negative impact on the adoption of insurance in two studies (Koirala & Bhandari, 2018; Mbonane & Makhura, 2018) while positive impact on WTP for insurance in 11 studies (Dahal et al., 2022; Danso-Abbeam et al., 2014; Devkota et al., 2020; Dong et al., 2020; Ellis, 2016; Jimoh Ibitoye, 2012; Mensah et al., 2023; Nyaaba et al., 2019; O'Reilly et al., 2018; Oduniyi et al., 2020). The price, premium, or amount paid detrimentally affected the willingness to pay (WTP) for insurance (Bannor et al., 2023; Liu et al., 2021; Singh, 2017; Suharyanto et al., 2021).

Insurance adoption positively impacted livestock income in one study (Subedi & Kattel, 2022). The level of coverage and duration of premium payments positively influenced the desire of poultry producers in Ghana to enroll in agricultural insurance (Bannor et al., 2023). In one study, premium rate knowledge, crop insurance knowledge, and scale of farming negatively impacted crop insurance (Musonda, 2012). The acceptance of premium payments and the passage of time influenced the inclination to make payments for livestock insurance in China (Xiu et al., 2012).

Insurance companies and agents are crucial in facilitating and promoting insurance adoption by providing guidance, policy options, and personalized assistance to potential policyholders. The evaluation of relevant literature indicates that the functions performed by insurance companies and insurance agents had a positive influence on the inclination to make payments for livestock insurance in Nepal (Devkota et al., 2020). The insurance procedure can also impact the farmers' inclination to invest in coverage. The complex process of insurance had a negative impact on farmers' willingness to pay for insurance (Koirala & Bhandari, 2018).

Previous purchasing of agriculture production cost insurance, damage percentage, and discount rate positively impacted farmers' WTP in Indonesia (Mutaqin & Usami, 2019). The propensity to pay for insurance was positively influenced by the nature of the product and the act of purchasing (Schmidt & Bijmolt, 2020). According to the literature review, insurance satisfaction has a positive impact on crop insurance adoption (Sadati et al., 2010).

3.7. Social and Community Factors

The adoption of insurance can be influenced by group membership. Group membership can influence the acceptance of insurance. The adoption of crop insurance in Nigeria was positively impacted by group membership and extension contact (Madaki et al., 2023). The results of these research suggest that farmers' likelihood of participating in crop insurance is positively affected by their access to extension services. (Adjabui et al., 2019; Ali, 2013). Research (Gulseven, 2020) shows that union membership positively impacted WTP for insurance.

Access to finance and contacts with agents influenced Nigerians' propensity to adopt farm insurance (Sami, 2017). Following the literature review, membership organizations positively impacted farmers' interest in cocoa price insurance in Ghana (Danso-Abbeam et al., 2014). This study demonstrates that farmer-based organizations (FBOs) favorably impact farmers' inclination towards engage in crop protection (Adjabui et al., 2019). Government funding influenced WTP for livestock husbandry insurance in Inner Mongolia, China (Dong et al., 2020).

3.8. Financial Factors

The research found that access to credit positively influenced the willingness to pay (WTP) for insurance (Akintunde, 2015; Ali, 2013; Arshad et al., 2016; Oduniyi et al., 2020), but it had an unfavorable effect on WTP for insurance in two studies (Ellis, 2016; Ghazanfar et al., 2015). A survey conducted by Sami (2017) showed that having easy access to financing and establishing connections with agents positively affected the inclination to take crop insurance. According to Madaki et al. (2023) discovered that having bank access positively impacted the uptake of agricultural insurance. Dong et al. (2020) discovered a positive correlation between bank loans and the willingness to purchase animal husbandry insurance. The literature review indicated that risk aversion positively influenced the propensity to participate in crop insurance in India. Additionally, the influence of having several crops, savings, and borrowings on willingness to join crop insurance was negative (Ramasubramanian, 2012). The study conducted by Subedi and Kattel (2022) found that the availability of loans had a beneficial effect on livestock insurance.

3.9. Geographic and Location-Based Factors

In their study, Mohammed and Ortmann (2005) discovered that off-farm investment, farm location, and transaction cost negatively influenced the willingness to pay for insurance. On the other hand, information had a positive effect. According to Ali (2013), found that the utilization of tractors, tube wells, and the cultivation of food crops in rainfed areas of Pakistan positively impacted the farmers' willingness to pay for index-based crop insurance in the Soon Valley region. While, Mbonane and Makhura (2018) discovered that the spatial positioning of farms had both positive and negative impacts on farmers' inclination towards crop insurance.

The literature analysis revealed that the proximity of agriculture to the river and the elevation of farmland had an adverse impact on the inclination to pay for insurance in the Khyber Pakhtunkhwa province of Pakistan. Conversely, the degree of commercialization and the underlying provision of insurance had a beneficial impact (Fahad & Jing, 2018).

3.10. Psychological and Attitudinal Factors

There was a positive relationship between risk aversion and willingness to pay for insurance, as measured by farm equity ratios Sherrick et al. (2004). The literature analysis highlighted a study that linked risk aversion to a greater propensity to purchase insurance (Ramasubramanian, 2012). Dong et al. (2020) showed that the level of risk perception had a favorable influence on the willingness of individuals in China to pay for livestock husbandry insurance. Ghazanfar et al. (2015) Pakistani farmers' willingness to pay for crop insurance was positively influenced by their amount of risk exposure, the type of crops they planted, and the severity of crop loss. The research conducted by Mehmood et al. (2022) demonstrated a positive impact on individuals' willingness to pay (WTP) for crop insurance. This discovery was in line with the outcomes of two prior investigations carried out by Mutaqin and Usami (2019) and Sherrick et al. (2004). Research conducted by Adjabui et al. (2019) has demonstrated that the attitude score has a favorable impact on farmers' inclination to support crop insurance financially. According to Bannor et al. (2023) concluded that the inclusion of risk coverage had a favorable influence on individuals' inclination to engage in agricultural insurance. Conversely, in another study by Nugrahaini et al. (2021), it was observed that risk had an adverse effect on individuals' desire to pay for livestock insurance. In a prior study conducted by Arshad et al. (2016), it was found that having access to services had a detrimental effect, whereas being exposed to floods and having both public and private insurance had a beneficial effect on individuals' willingness to pay for flood insurance. In a study conducted by Mutaqin and Usami (2019), trust was found to have a beneficial influence on farmers' inclination to make payments. According to the literature review, a study conducted by Shang and Xiong (2021) discovered that factors such as response cost, response efficiency, self-efficacy, perceived probability, perceived severity, and overall expenditure favorably influenced the WTP for insurance.

3.11. Environmental Factors

The study conducted by Koirala and Bhandari (2018) found that the rise in temperature, heightened intensity of rainfall, and overall climate change had a favorable effect on the inclination of individuals in Nepal to pay for insurance. A study by Budhathoki et al. (2019) found that floods occurring in the past five years had a beneficial effect on the willingness to pay (WTP) for insurance covering rice and wheat crops. According to a study in the literature review, meteorological information, drought, and flood have shown a beneficial effect on the acceptance of agricultural insurance in Nigeria (Madaki et al., 2023). Dong et al. (2020) concluded that the collaboration between weather herders and the government had a beneficial influence on their inclination to invest in livestock husbandry insurance. The literature evaluation indicates that the distance to the weather station had a negative effect, whereas time and the number of years favorably impact the readiness to pay for technology adoption, as demonstrated in a study by Hill et al. (2013).

4. Conclusion And Policy Suggestions

The findings from this literature survey underscore the intricate interplay of factors affecting farmers' willingness to invest in livestock insurance. While some variables consistently showed positive or negative associations, others exhibited divergent effects across different contexts. Policymakers and insurance providers must consider this diversity when designing and marketing insurance products. Additionally, tailored strategies and educational efforts should

address specific barriers to adoption in different regions. The following are the policy suggestions of the current study:

- There is a need to develop region-specific educational programs that target demographics and socio-economic groups with a low willingness to pay.
- Flexible premium options must be provided by considering the financial constraints of smallholder farmers.
- Group-based insurance programs can foster shared responsibility and increase adoption rates.
- Enhancing awareness of environmental and weather-related risks and the potential benefits of insurance in mitigating these risks.
- Addressing psychological factors such as risk perception and trust (including risk communication campaigns and testimonials) from satisfied insurance beneficiaries can benefit the farmers.
- Tailoring insurance coverage options to specific livestock breeds and crop types, considering local conditions.
- Promoting access to credit and financial services in rural areas could make it easier for farmers to afford insurance premiums.
- Collaborating with government agencies (to subsidize insurance premiums or provide incentives to farmers and insurers) would increase insurance adoption.

This research provides valuable insights into the complex decision-making processes of farmers regarding livestock insurance adoption. Policymakers and insurance providers can use these findings to develop strategies and policies that foster greater resilience in agricultural communities.

Authors Contribution

Rehana Kousar: Initiated the core idea of performed data analysis and drafting.

Tusawar Iftikhar Ahmad: Study design, Concept topic idea, conclusion, supervision direction

Samar Abbas: Provided guidance for data analysis, reviewed, supervised overall study

Muhammad Azhar Bhatti: Reviewed and revised overall quality and writeup of the manuscript

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest w.r.t the research, authorship and/or publication of this article.

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