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Original Research Article

Safeguarding Nepal's Paddy Farmers: Necessity, Challenges, and Policy Directions for Crop Insurance

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Abstract

Purpose: This study aims to identify and analyze challenges of the adoption of paddy crop insurance in the terai regions, focusing on farmers' perceptions, institutional efficiency, and gaps in policy implementation.

Design/methodology/approach: The cluster-based random sampling was used to collect data from 460 respondents, divided into insured and non-insured groups from paddy-growing farmers from Chitwan and Bardiya districts.

Findings: Major constraints include limited awareness, negative perceptions, delayed claim settlements, and weak institutional coordination. The non-insured farmers highlighted poor understanding of the policy, perceived low payouts, financial limitations, and inadequate support from financial institutions as key obstacles.

Conclusion: The findings revealed that strengthening awareness campaigns, ensuring timely and transparent claim processing, and linking insurance with credit and subsidy programs are vital policy measures to increase adoption and enhance resilience in Nepal's rice sector

Implications: This study provides suggestions to policymakers, regulatory institutions, and insurers to design and execute the paddy crop insurance program by addressing its actual challenges faced by farmers.

Originality/value: This study provides a novel perspective by incorporating the field situation, examination of existing policies, and stakeholders' institutional views.

JEL Classification: Q14, Q12, G22, Q18

Introduction

Agriculture continues to be a cornerstone of Nepal's economy, employing nearly 60% of the population and contributing 24.12% to the national gross domestic product (GDP) (Ministry of Agriculture and Livestock Development [MoALD], 2024; Ministry of Finance [MoF], 2023). Among crops, paddy (rice) plays a central role, both economically and nutritionally, supplying roughly 30% of daily calorie intake for Nepalese households (Food and Agriculture Organization [FAO], 2021; Cereal Systems Initiative for South Asia [CSISA], 2024). Grown across elevations from the Terai plains to the high hills (up to 3,000 meters), paddy cultivation occurs in both the main and spring seasons, with the latter occupying only about 8% of the total area (MoALD, 2024). Paddy farming contributes approximately 12.81% to agricultural GDP and is vital for rural livelihoods, making its productivity directly tied to food security and household income.

Despite its importance, paddy production in Nepal is increasingly vulnerable to both climatic and biotic risks. Extreme rainfall, floods, droughts, and pest or disease outbreaks frequently cause significant yield losses (Adhikari & Sharma, 2021; Bhandari et al., 2020). Historical

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events, such as the Koshi floods in 2008, midwestern floods in 2021, and off-season floods in 2022, exemplify the scale of damage to paddy fields, resulting in losses amounting to USD .43 billion, while government compensation has historically fallen short of the actual losses (Asian Development Bank [ADB], 2009; Government of Nepal [GoN], 2024). These recurring events underline the high production risk associated with paddy cultivation, making it a priority for risk mitigation strategies such as crop insurance.

Globally, crop insurance has been recognized as an effective tool to stabilize farm income and protect farmers from climate-induced shocks. In countries such as India, China, and the United States, crop insurance penetration has been linked with higher resilience of smallholder farmers to natural disasters and market volatility (Mahul & Stutley, 2010; Hazell et al., 2010). However, in Nepal, despite the formal introduction of subsidized agriculture and livestock insurance in 2013, adoption remains strikingly low. Crop insurance represents only 10% of total insurance sales, with paddy insurance accounting for a mere .52% of policies issued (National Insurance Authority [NIA], 2024; Department of Agriculture [DoA], 2022). This contrasts sharply with livestock insurance, which continues to dominate agricultural insurance uptake, indicating a critical adoption gap.

The persistent low uptake of paddy insurance in Nepal raises important questions: why do smallholder farmers, whose livelihoods are directly dependent on paddy, fail to adopt insurance policies designed to mitigate risk? Existing literature highlights multiple barriers, including lack of awareness, perceived complexity of insurance products, limited trust in insurers, and inefficiencies in institutional outreach (Sharma et al., 2019; Bhandari et al., 2020). Additionally, socio-economic factors, behavioral biases, and limited financial literacy may hinder adoption, as observed in other emerging economies (Giné et al., 2008; Cole et al., 2013). Yet, empirical studies systematically examining these barriers in the context of Nepalese paddy farming remain scarce, leaving a significant research gap.

Addressing this gap is crucial for enhancing the effectiveness of crop insurance as a risk management tool. A systematic investigation of farmers' knowledge, perceptions, attitudes, and constraints regarding paddy insurance is urgently needed to inform evidence-based policy design. This study focuses on two central questions: (1) Why is the adoption of paddy insurance so limited despite its critical importance? (2) What are the key challenges faced by farmers that impede wider participation? By examining these questions, the study aims to provide insights into the institutional, socio-economic, and policy-related factors influencing adoption and to offer recommendations for enhancing the uptake of crop insurance.

This study focuses on two Terai districts, Chitwan and Bardiya, which feature both main and spring season paddy cultivation. By analyzing farmers' perceptions, institutional efficiency, and policy implementation gaps, the study seeks to provide actionable recommendations for strengthening insurance coverage, improving adoption rates, and enhancing resilience against production shocks. Findings from this research are expected to inform policymakers, insurers, and agricultural stakeholders, contributing to the development of a more robust and equitable crop insurance framework in Nepal.

Literature Review

Over the past decade, research on agricultural insurance has highlighted critical determinants of adoption, particularly among smallholder farmers in developing countries. Empirical studies emphasize that both socioeconomic factors (e.g., education, income, landholding, gender) and institutional dimensions (e.g., policy design, claim settlement efficiency, outreach mechanisms) shape farmers' participation in crop insurance programs (Ghimire & Kumar, 2013; Akter et al., 2016; Ullah et al., 2019). Behavioral and cognitive factors, including awareness, trust, financial literacy, and risk perception, further influence decision-making and adoption patterns (Antwi-Agyei et al., 2021; Timilsina et al., 2022; Sinha & Tripathi, 2016).

Globally, studies in South Asia, Sub-Saharan Africa, and Latin America indicate that innovations such as index-based insurance, digital platforms, mobile-based claims verification, and bundled financial services significantly enhance adoption, improve transparency, and reduce transaction costs (Mahul & Stutley, 2010; Cole et al., 2013; Fatima, 2025). Despite the effectiveness of such interventions, evidence from Nepal suggests persistent low uptake of paddy insurance, pointing to systemic barriers that remain insufficiently explored (NIA, 2024; DoA, 2022).

Historical events such as the Koshi floods (2008), midwestern floods (2021), and off-season floods (2022) highlight the susceptibility of Nepalese farmers, with losses in paddy fields exceeding USD .1 billion in 2022 alone (ADB, 2009; GoN, 2024). Globally, smallholder farmers in South Asia, Sub-Saharan Africa, and Latin America face similar climate-induced risks, emphasizing the need for robust risk transfer mechanisms such as crop insurance (Mahul & Stutley, 2010; Hazell et al., 2010). Understanding crop insurance adoption requires an integration of behavioral, socio-economic, and institutional theories.

The Diffusion of Innovations Theory (Rogers, 2003) explains adoption patterns through awareness, perceived benefits, and trialability. Behavioral Economics emphasizes risk perception, cognitive biases, and decision heuristics affecting participation (Kahneman & Tversky, 1979; Giné & Yang, 2009). The Theory of Planned Behavior (TPB; Ajzen, 1991) is widely applied to explain how attitudes, subjective norms, and perceived behavioral control influence farmers' insurance uptake intentions. Financial literacy, socio-economic status, and institutional factors often mediate these behavioral intentions, impacting risk management decisions.

In Nepal, the government introduced subsidized agricultural and livestock insurance in 2013 to mitigate climate and production risks. Yet, uptake remains extremely low, with paddy insurance accounting for only .52% of total crop and livestock policies (NIA, 2024; DoA, 2022). Weak policy distribution networks, high transaction costs, complex enrollment procedures, and delayed claim settlements exacerbate adoption challenges (Ghimire & Sapkota, 2019; IFAD, 2021; Acharya et al., 2023). Farmers frequently prefer livestock insurance due to its faster claims process and direct link to income stabilization, highlighting the need for tailored insurance products for paddy cultivation (Pandey et al., 2022; Budhathoki et al., 2019).

Internationally, evidence suggests that policy design strongly influences adoption. Subsidies, index-based insurance, bundled financial services, and digital platforms have significantly improved uptake in India, China, and the Philippines (Mahul & Stutley, 2010; Cole et al., 2013; Fatima, 2025). Mobile-based claims verification and climate-indexed insurance enhance transparency, reduce transaction costs, and improve resilience

in developing economies (Nosurullaev, 2024; FAO, 2020). Socioeconomic characteristics-education, income, landholding size, and access to credit-positively influence insurance uptake (Ghimire & Kumar, 2013; Khan & Hasan, 2022). Female-headed households, marginalized caste groups, and tenant farmers face structural barriers that limit participation (Akter et al., 2016; Ullah et al., 2019; Swain & Hembram, 2020). Age, farming experience, and prior loss exposure also mediate adoption, although findings vary across contexts (Aina et al., 2024; Ghimire et al., 2023). Full-time farmers and those engaged in off-farm income-generating activities are more likely to adopt due to greater exposure to risk and financial capacity to pay premiums (Rokade, 2016; Aina et al., 2024).

Limited awareness, low literacy, and reliance on informal coping mechanisms (borrowing, livestock sales) reduce trust in insurance schemes (Ghosh et al., 2020; Antwi-Agyei et al., 2021). Training, outreach, and advisory services consistently improve knowledge and confidence, bridging the literacy-to-action gap and enhancing adoption (Baral & Gyawali, 2023; Biswakarma & Rana, 2021). Farmers with a greater understanding of policy coverage and timely claim processes are more likely to participate (Timilsina et al., 2022; Gautam et al., 2017; Sinha & Tripathi, 2016).

While empirical studies in Nepal have examined socioeconomic and institutional factors separately, few integrate behavioral, policy, and institutional dimensions simultaneously. Existing literature highlights both demand-side constraints (awareness, trust, literacy) and supply-side challenges (institutional efficiency, claim processing, outreach), yet comprehensive analysis remains limited. Moreover, global studies indicate that combining financial literacy, advisory services, and modern insurance mechanisms can improve adoption, but such integrative approaches are rarely applied in the Nepalese context.

Methods

The study focused on paddy as it is a staple crop with strategic importance for Nepal's economy, contributing significantly to GDP, national food security, and farmer livelihoods. Two Terai districts, Chitwan and Bardiya, were selected purposively based on three criteria: (i) extensive paddy cultivation representing similar climatic conditions but located in different provinces, (ii) presence of double-season (monsoon and spring) paddy farming, and (iii) highest number of paddy crop insurance policies issued in fiscal year 2021/22 (DoA, 2022).

Chitwan's insurance branch offices are mainly located in Bharatpur Metropolitan City, 17–33 km from major paddy-producing municipalities, indicating limited accessibility for farmers. Only 3–11% of households in these municipalities reported year-round food sufficiency (Central Bureau of Statistics [CBS], 2023). In Bardiya, branch offices are situated in Gulariya, 20–25 km from Bansgadhi Municipality, where 93% of households engage in agriculture, but only 22.14% have year-round food sufficiency (Bansgadhi Municipality, 2017).

The population comprised all insured and non-insured paddy-growing farmers in Chitwan and Bardiya districts for the fiscal year 2021/2022. Cluster-based random sampling was used to ensure proportional representation of insured and non-insured farmers. Wards with fewer than 10 insured farmers were excluded. Using Cochran's (1977) formula at a 95% confidence level, a sample size of 460 farmers was determined, equally divided between insured (n = 230) and non-insured (n = 230) respondents. Cluster sampling enabled robust comparative analysis of adoption determinants while minimizing bias.

Primary data were collected through structured household surveys using a pre-tested questionnaire. The survey captured socio-demographic information, farm characteristics, access to resources, agricultural knowledge, attitudes toward insurance, and insurance adoption behaviors. Secondary data were obtained from government and institutional sources, including the MoALD, CBS, DoA, NIA, and published reports and journals relevant to paddy cultivation and crop insurance in Nepal. Data were analyzed using Stata software. Five-point Likert scale was used to measure the attitude, perceptions, and opinions of respondents on the level of agreement. Likewise, the index value was applied to simplify, standardize, and interpret complex sets of obtained information for meaningful analysis. Index values ranged from -1 (disagreement) to +1 (agreement). Similarly, Chi-Square (χ^2) tests were applied to examine the significant association between categorical variables.

Results and analysis

Socio-demographic profile

The socio-demographic profile of respondents from Chitwan and Bardiya districts (Table 1) indicates that male farmers dominated, comprising 64.59% of the sample, while females accounted for 35.41%. This aligns with findings by Akter et al. (2016), who reported lower participation of female-headed households in crop insurance schemes. Respondents' ages ranged from 20 to 86 years, with a mean of 59.59 years, reflecting active involvement of both younger and older farmers in paddy cultivation. The influence of age on insurance adoption remains mixed, consistent with Sujarwo and Rukmi (2018), though differing from studies suggesting higher adoption among younger farmers (Aina et al., 2024; Bharati et al., 2014).

Table 1: Socio-demographic characteristics of respondents

Characteristics	Descriptions	Districts		Chi-square/ *t-value*
		Chitwan	Bardiya	
Gender	Male 298 (64.59)	167 (66.8)	131(62.38)	.98
	Female 162 (35.41)	83(33.20)	79(37.62)	
Age (years)	Min:20	Min:24	Min:20	
	Max: 86	Max: 86	Max: 73	
	= 49.59	= 51.60	= 47.18	
	σ =11.98	σ =12.00	σ =11.53	
Involvement in the organization	Yes	176(70.40)	90(42.86)	35.50*
	No	74(29.60)	120(57.14)	
Training received	Yes	89(35.60)	43(20.48)	12.77*
	No	161(64.40)	167(79.52)	
Ethnicity	Bhramin	94(37.60)	5(2.38)	115.74*
	Chhetri	61(24.40)	35(16.67)	
	Janajati	73(29.20)	154(73.33)	
	Dalit	14(5.60)	7(3.33)	
	Madheshi	8(3.20)	9(4.29)	
Educational level	Illiterate	34(13.60)	83(39.52)	42.92*
	Only read and write	110(44)	66(31.43)	
	Less than SLC	66(26.40)	43(20.48)	
	Intermediate level	28 (11.20)	15(7.14)	
	Bachelor's level	10(4)	3(1.43)	
	Above Bachelors level	2(.80)	0(0)	
Occupation	Farming	221(88.40)	178(84.76)	10.157
	Government job	6(2.40)	10(4.76)	
	Daily wages	2(.80)	9(4.29)	
	Job at private sector	8(3.20)	5(2.38)	
	Foreign employment	4(1.60)	4(1.90)	
	Business	7(2.80)	2(.95)	
	Others	2(.80)	2(.95)	
Farming experience (years)	Min= 1	Min= 1	Min= 2	
	Max= 60	Max= 60	Max= 55	
	= 23.83	= 22.93	= 24.90	
	σ =12.91	σ =13.22	σ =12.47	
Land under paddy (ha)	Min= .08	Min= .08	Min= 0.13	
	Max= 4.06	Max= 4.06	Max= 3.05	
	= .25	= .1	= .36	
	σ = 0.245	σ = .2	σ = .2	

Note (s). Figures in parentheses indicate percentage, where * = 10 % level of significance, ** = 5 % level of significance, and *** = 1 % level of significance.

In Chitwan, Brahmin farmers constituted the largest share (37.6%), while Janajati farmers predominated in Bardiya (73.33%). This variation may influence insurance adoption, as higher-caste farmers, such as Brahmins, generally show higher participation in crop insurance compared to marginalized groups (Swain & Hembram, 2020). Educational attainment also differed, with 86.4% of farmers in Chitwan and 60.48% in Bardiya having formal education, supporting the view that higher education increases the likelihood of insurance adoption (Gautam et al., 2017). The average farming experience was substantial in both districts (Chitwan, 22.93 years; Bardiya, 24.9 years), which can positively affect adoption due to greater exposure to risks (Ghimire et al., 2023). Additionally, training was found to be

important: 35.6% of farmers in Chitwan and 20.48% in Bardiya had received training, significantly influencing their willingness to adopt insurance schemes (Baral & Gyawali, 2023).

Reasons for Non-adoption of Insurance by the Non-insured Respondents

Table 2 summarizes the reasons for non-adoption among respondents, including those who never participated and those who discontinued insurance. The majority (82.17%) did not perceive cost as a significant barrier, indicating that affordability was not a primary concern. Only 25.38% viewed the insurance scheme as unnecessary, while 74.62% did not consider the lack of perceived need an obstacle. Financial constraints affected only 18.26% of respondents, and insufficient payout was cited by just 16.51%, with 83.48% indicating that claim amounts did not hinder adoption.

Table 2: Reasons for non-adoption of the insurance scheme by the non-insured respondents

SN	Reasons	Level				Index	Rank
		Low	Moderate	High	No		
1	Too expensive	28 (12.17)	1 (.43)	12 (5.22)	189 (82.17)	.09	V
2	No need	34 (13.08)	3 (1.15)	29 (11.15)	194 (74.62)	.18	II
3	No cash/credit to pay the premium	28 (12.17)	1(0.43)	13 (5.65)	188 (81.74)	.10	IV
4	Payout too small	28 (12.17)	3 (1.30)	7 (3.04)	192 (83.48)	.08	VIII
5	Don't understand the insurance policy	34 (14.78)	1(.43)	49(21.30)	146(63.48)	.26	I
6	Cost-based /not yield-based scheme	20 (8.70)	3(1.30)	7(3.04)	200(86.96)	.07	X
7	Do not like the insurance	27(11.74)	3(1.30)	7(3.04)	193 (83.91)	.08	VIII
8	Bought insurance last year but did not get claimed amount	27(11.74)	1(.43)	4(1.74)	198(86.09)	.06	XII
9	Bought insurance last year but not satisfied	28(12.17)	1(.43)	7(3.04)	194(84.35)	.07	X
10	Proper facilities are not available at financial institutions	34 (14.78)	2(.87)	9(3.91)	185(80.43)	.09	V
11	Difficult/lengthy procedures	29(12.61)	1(.43)	17(7.39)	183(79.57)	.11	III
12	Mandatory provision of being land owner	25(10.87)	2(.87)	11(4.78)	192(83.48)	.09	V
Mean		-	-	-	-	.11	

About 36.52% of respondents cited a lack of understanding of insurance policies as a reason for non-adoption, highlighting the need for awareness and educational campaigns. In contrast, 63.48% did not view this as a barrier. Most respondents (86.96%) indicated that the type of insurance policy (yield-based or cost-based) did not influence their decision. Thus, 83.91% expressed a positive attitude toward insurance, and past experiences of not receiving claims were not considered significant, with 84.35% satisfied with prior insurance participation.

T**able 3:** Perceived Constraints of the Respondents with the Adoption of Insurance

SN	Statements	Level				Index	Rank
		Low	Moderate	High	No		
1.	Lack of knowledge among producers regarding the benefits of crop insurance.	36(7.81)	48(10.41)	220(47.74)	156(33.85)	.57	I
2.	Lack of encouraging policy.	75(16.27)	47(10.19)	138(29.94)	200(43.40)	.42	IV
3.	Lack of public confidence in the agriculture insurance market.	75(16.27)	34(7.37)	170(36.89)	181(39.27)	.47	III
4.	Crop insurance is not a priority for producers compared to livestock insurance.	89(19.31)	48(10.41)	92(19.96)	231(50.12)	.33	VI
5.	Low economic status of the farmer	121(26.25)	32(6.94)	58(12.58)	249(54.03)	.25	VII
6.	Insufficient coordination and linkage between the concerned authority and farmers.	86(18.66)	43(9.33)	166(36.02)	165(35.80)	.48	II
7.	Procedural difficulties and complex procedures	92(19.96)	49(10.63)	95(20.61)	234(50.77)	.34	V
8.	A smaller number of institutions provide insurance	133(28.86)	28(6.07)	49(10.63)	251(54.46)	.24	IX
9.	Excessive wastage of time during crop insurance	110(23.87)	41(8.89)	47(10.19)	262(56.85)	.24	IX
10	Less coverage by insurance providers	114(24.73)	50(10.85)	47(10.19)	249(54.03)	.25	VII
Mean						.26	

Respondents identified several factors affecting crop insurance adoption. While 36.89% viewed lack of public confidence in the agricultural insurance market as a major issue, 39.27% did not consider it a constraint, highlighting the need for trust-building measures (Ghimire et al., 2023). Most respondents (50.12%) did not see crop insurance as a lower priority compared to livestock insurance, although 19.96% considered it significant.

Economic status was not perceived as a major barrier by 54.03% of respondents, despite prior studies emphasizing its importance (Budhathoki et al., 2019). Insufficient coordination between authorities and farmers was noted as a barrier by 36.02%, supporting findings that weak institutional linkages hinder adoption (Acharya et al., 2023). Procedural complexities affected only 20.61% of respondents, suggesting the need for simplified enrollment and claims processes (Bhattarai, 2024).

Facility-related issues were reported by fewer respondents: 19.57% felt limited access to financial institutions affected adoption, 20.43% cited complex or lengthy procedures, and 16.52% considered land ownership requirements a barrier. The majority in each case did not perceive these factors as significant obstacles, suggesting that awareness and understanding of insurance are more critical determinants of adoption than procedural or institutional constraints.

Perceived barriers to insurance adoption among respondents

Respondents identified knowledge gaps as the primary constraint to adopting crop insurance, with 47.74% rating lack of awareness of insurance benefits as a "high" barrier. This aligns with previous studies emphasizing the importance of awareness and education in promoting insurance uptake (Biswakarma & Rana, 2021; Sinha & Tripathi, 2016). In contrast, 43.40% of respondents reported that the absence of an encouraging policy did not hinder adoption, though 138 respondents still viewed policy design as a significant barrier. This supports prior findings that rigid and inflexible policy structures in Nepal limit crop insurance adoption (Devkota et al., 2021).

Regarding service providers, most respondents did not view the limited number of providers, excessive time requirements, or limited coverage as significant barriers. Thus, the primary obstacles to adoption were knowledge gaps, lack of public confidence, and inadequate coordination, whereas procedural issues, provider limitations, and economic status were less influential.

Discussions

This study examined the role of crop insurance as a risk management tool for paddy farmers in Chitwan and Bardiya districts, highlighting its necessity and the challenges in adoption. Crop insurance is widely recognized as a critical safeguard for farmers, providing a safety net against production and market risks, reducing reliance on informal coping mechanisms, and lowering the burden of post-disaster compensation on governments (World Bank, 2019; FAO, 2020). In Nepal, particularly among smallholders, crop insurance contributes to financial resilience and livelihood stability.

The socio-demographic profile of farmers revealed male dominance, higher education in Chitwan, greater Janajati participation in Bardiya, and substantial farming experience. These characteristics influence adoption behavior, consistent with the Diffusion of Innovations Theory (Rogers, 2003), which posits that adopter characteristics, including education and experience, significantly shape innovation uptake. The study found that higher education and prior exposure to agricultural risks increase receptivity to insurance schemes, supporting findings from Gautam et al. (2017) and Baral and Gyawali (2023). Conversely, the predominance of Janajati farmers in Bardiya, a historically marginalized group, reflects lower adoption rates compared to Brahmin-dominated Chitwan, aligning with studies showing that socio-economic and caste-based inequalities affect access to formal financial instruments (Swain & Hembram, 2020; Ullah et al., 2019).

Despite the recognized necessity of crop insurance, adoption remains limited due to multiple barriers. Lack of knowledge and awareness was the leading constraint, corroborating Chapagain & Ghimire (2023) and Timilsina et al. (2022). Procedural complexities and cumbersome claim processes further discourage farmers, as noted in IFAD (2021) and Bhattarai (2024). Financial constraints, including upfront premium payments and delays in government disbursement of grants to insurance companies, also limit adoption, consistent with FAO (2020) and Chapagain and Ghimire (2023). These findings resonate with the Risk Perception Theory, which emphasizes that perceived risk and complexity influence decision-making; farmers avoid schemes perceived as administratively or financially burdensome (Slovic, 1987).

Institutional barriers, including rigid land ownership requirements and weak distribution networks, exacerbate exclusion, particularly for tenants and marginalized farmers. These results align with global evidence indicating that institutional rigidity, limited access points, and low transparency hinder adoption in developing countries (Ullah et al., 2019; Antwi-Agyei et al., 2021). Interestingly, while prior studies (Ghosh et al., 2020) suggest that claim dissatisfaction strongly influences adoption, the present study found that most farmers reported satisfaction with past insurance experiences, indicating that perception of procedural fairness may be improving locally.

Comparatively, global studies show similar patterns. In India and Bangladesh, lack of awareness, complicated enrollment, and delayed payouts are primary obstacles (Antwi-Agyei et al., 2021; Rajeev et al., 2020). Contrarily, studies in China and Vietnam highlight that government subsidies and community-based insurance schemes significantly enhance adoption, suggesting that institutional support and trust-building are critical factors influencing participation. The divergence in Nepal may be due to limited subsidy disbursement, lower institutional trust, and uneven policy implementation.

To address these barriers, farmer-centered reforms are essential. Strategies should include targeted awareness campaigns, simplification of procedures, transparent and timely claim settlements, financial support mechanisms, and stronger coordination between institutions and farmers. Trust-building measures, particularly among marginalized groups, are critical for equitable adoption and improved agricultural resilience.

Conclusion and Implications

Paddy, as Nepal's staple crop, remains highly vulnerable to biotic and abiotic stresses, and climate variability has intensified both production and income risks for farmers. This study highlights that crop insurance is a critical tool for mitigating such risks, offering a financial safety net to farmers while reducing the government's burden during crop losses.

The analysis revealed that adoption of paddy insurance remains extremely low, primarily due to limited awareness, weak institutional coordination, lack of trust, complex procedures, and financial constraints. Socio-demographic factors, including education, caste, gender, and farming experience, also influence adoption behavior. These findings underscore that merely making insurance available is insufficient; adoption depends on how well the schemes align with farmers' realities and capacities.

To enhance effectiveness and sustainability, paddy crop insurance must be accessible, affordable, inclusive, and designed to cover major production risks. Practical measures include targeted awareness campaigns delivered through local cooperatives, extension agents, and farmer networks; simplification of enrollment and claim procedures; and timely disbursement of government grants to insurers. Priority support for smallholders, women, and marginalized groups through higher premium subsidies can further enhance inclusivity. Strengthening coordination among farmers, insurers, and local authorities, potentially facilitated by digital platforms and integration with credit or subsidy programs, can improve trust and participation.

These interventions are essential not only to increase adoption but also to bolster agricultural resilience and safeguard livelihoods. A responsive and farmer-centric insurance system can contribute significantly to Nepal's long-term goals of food security, equitable development, and sustainable agricultural growth.

Limitations and Future Research

This study is limited by its focus on two Terai districts, which restricts the generalizability of the findings to other ecological regions of Nepal. The cross-sectional design and reliance on self-reported data may introduce recall and response biases. Moreover, the purely quantitative approach limits deeper insights into behavioral and institutional dynamics influencing insurance adoption. Future research should employ mixed-method or qualitative designs to capture farmers lived experiences and trust-related issues. Longitudinal studies are recommended to assess the long-term impact of crop insurance on income stability and resilience, while broader regional coverage and evaluation of digital and index-based insurance models would enhance policy relevance.

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Conflict of Interest

The Author(s) declared having no conflict of interest in the research work.

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Ethical Statement

This study was conducted without human or animal subjects, so formal ethical approval was not required. All authors confirm that the work is original and adheres to accepted research ethics and standards.

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References

Acharya, R., Chapagain, R. K., Jagari, D. B., & Shahi, L. B. (2023). Farmers' perception and awareness towards agriculture insurance as a tool of risk management in Kaski and Chitwan Districts of Nepal. The Lumbini *Journal of Business and Economics*, *11*(1), 191-212. DOI: 10.3126/ljbe.v11i1.54326

Adhikari, A., & Sharma, S. (2021). Analyzing paddy insurance adoption and its impacts on farmers' resilience in Nepal. *Sustainability*, 13(7), 4049. DOI: 10.3390/su13074049

Agriculture Development Office. (2022). Annual progress and statistical report: Fiscal year 2023/24.

Aina, I. V., Ayinde, O. E., Thiam, D. R., & Miranda, M. J. (2024). Climate risk adaptation through livestock insurance: Evidence from a pilot programme in Nigeria. *Climate and Development*, *17*(11), DOI: 10.1080/17565529.2024.2373801

Akter, S., Krupnik, T. J., Rossi, F., & Khanam, F. (2016). The influence of gender and product design on farmers' preferences for weather-indexed crop insurance. *Global Environmental Change*, *38*, 217-229. DOI: 10.1016/j.gloenvcha.2016.03.010 PMID: 27212804 PMCID: PMC4862443

Antwi-Agyei, P., Quinn, C. H., & Adiku, S. G. K. (2021). Agricultural insurance access and acceptability: Examining the case of smallholder farmers in Ghana. *Agriculture & Food Security*, *10*(1), 49. DOI: 10.1186/s40066-021-00292-y

Asian Development Bank. (2009). Consequences of Koshi flood 2008 in terms of sedimentation characteristics and agricultural practices. Geoenvironmental Disasters. https://doi.org/10.1186/s40677-017-0069-x

Bansgadhi Municipality. (2017). Profile of Bansgadhi Municipality. Office of the Executive, Bansgadhi Municipality.

Baral, S., & Gyawali, K. (2023). Effectiveness of farmer's training in Nepal: A review. *Journal of Advances in Agriculture*, 15, 1-10. DOI: 10.24297/jaa.v15i.9680

Bhandari, P., Joshi, N. P., & Maharjan, K. L. (2020). Factors influencing farmers' decisions in the paddy insurance scheme in Nepal: A case study of Rupandehi District. *International Journal of Environment, Agriculture, and Biotechnology*, *5*(5), 1212-1218. 10.22161/ijeab/5.5.17

Bharati, R. C., Azad, N. K., Singh, K. M., Chakraborti, S., Chandra, N., & Singh, S. P. (2014). Factors affecting adoption of crop insurance in Bihar. *Journal of Agri Search*, *1*(2), 102-107. DOI: 10.17582/journal.jas/2014/1/2/102.107

Bhattarai, S. (2024). Assessing the effectiveness of agriculture insurance in Nepal. *Socio Economy and Policy Studies*, *4*(2), 78-81. DOI: 10.26480/seps.02.2024.78.81

Biswakarma, G., & Rana, N. (2021). Factors affecting crop insurance holding intention of farmers in Nepal. *International Journal of Research and Review*, 8(2), 294-309. 10.52403/ijrr.20210243

Budhathoki, N. K., Lassa, J. A., Pun, S., & Zander, K. K. (2019). Farmers' interest and willingness-to-pay for index-based crop insurance in the lowlands of Nepal. *Land Use Policy*, 85, 1-10. DOI: 10.1016/j.landusepol.2019.03.029

Central Bureau of Statistics. (2023). National sample census of agriculture 2021/22: Main report. Kathmandu, Nepal.

Cereal Systems Initiative for South Asia. (2024). Situation report on Nepal's agrifood systems: January 2024 (Bulletin No. 15). https://csisa.org/wp-content/uploads/sites/2/2024/01/230128-CSISA-UKR-NPL-SIT-REP-JAN.pdf

Cochran, W. G. (1977). Sampling techniques (3rd ed.). New York: John Wiley & Sons.

Devkota, D., Ghimire, Y. N., Timsina, K. P., Subedi, S., & Poudel, H. K. (2021). Determinants of livestock insurance adoption in Nepal. *Cogent Food & Agriculture*, *7*(1), 1952012. DOI: 10.1080/23311932.2021.1952012

Department of Agriculture (2022). Details of farmers receiving subsidies on crop insurance premiums (FY 2022/23 and 2023/24). Lalitpur, Nepal.

FAO. (2020). Strengthening climate resilient agriculture in Nepal (Project GCP/NEP/070/LDF). https://www.fao.org/3/ca8094en/CA8094EN.pdf

FAO. (2021). Rice and food security in Asia: Facts and policy recommendations. FAO Regional Office for Asia and the Pacific. https://www.fao.org/3/cb4635en/cb4635en.pdf

Fatima, E. (2025). Importance of agricultural insurance in Pakistan. The Agricultural Economist. https://www.agrieconomist.com/importance-of-agricultural-insurance-in-pakistan

Gautam, A., Thapa, G. B., & Khanal, U. (2017). Determinants of crop insurance adoption among rice farmers in Nepal. Agricultural and *Food Economics*, *5*(1), 1-16. DOI: 10.1186/s40100-017-0093-0

Ghimire, R., & Kumar, P. (2013). Agricultural insurance products in Nepal: Practice and prospects. (SSRN Working Paper No. 2374820). DOI: 10.2139/ssrn.2374820

Ghimire, R., Chapagain, R. K., Jagari, D. B., & Shahi, L. B. (2023). Farmers' perception and awareness towards agriculture insurance in Kaski and Chitwan, Nepal. *The Lumbini Journal of Business and Economics*, *11*(1), 191-212. DOI: 10.3126/ljbe.v11i1.54326

Ghimire, S. S., & Sapkota, D. (2019). Agricultural credit and insurance in Nepal: Coverage, issues, and opportunities. https://www.researchgate.net/publication/337490232_Agricultural_Credit_and_Insurance_in_Nepal_Coverage_Issues_and_Opportunities

Ghimire, Y. N., Timsina, K. P., & Thapa Magar, D. B. (2016). Preparation for implementing weather index insurance in Nepal (Discussion Paper). Socioeconomics and Agricultural Research Policy Division, *Nepal Agricultural Research Council*.

Ghosh, R. K., Gupta, S., Singh, V., & Ward, P. S. (2020). Demand for crop insurance in developing countries: New evidence from India. *Journal of Agricultural Economics*, *72*(1), 293-320. DOI: 10.1111/1477-9552.12403 PMID: 33518794 PMCID: PMC7821195

GoN. (2024). Nepal government offers compensation as flood death toll rises. Mathrubhumi. https://english.mathrubhumi.com/news/world/nepal-goverment-offers-compensation-to-flood-victims-4edaec54

International Fund for Agricultural Development. (2021). Rural finance and insurance in Nepal: Challenges and opportunities. https://www.ifad.org/en/web/operations/country/id/nepal

Khan, S., & Hasan, M. (2022). Factors influencing the adoption of crop insurance in Bangladesh: A survey analysis (SSRN Working Paper No. 4299324). DOI: 10.2139/ssrn.4299324

Lamichhane, N., Dhami, U., Dhakal, D., & Thapa, L. B. (2024). Rice cultivation area, demographic trends, and trade dynamics for food security in Nepal (2011-2021). *Plant-Environment Interactions*, *5*(6), e70020. DOI: 10.1002/pei3.70020 PMID: 39649068 PMCID: PMC11624010

Ministry of Finance, Nepal. (2023). Economic survey 2022/23. Government of Nepal. https://mof.gov.np/uploads/document/file/1710323031_Economic%20Survey%20Engslish%202022-23%20Eng%20Final%20for%20WEB.pdf

Ministry of Agriculture & Livestock Development (2024). Statistical information on Nepalese agriculture. Kathmandu, Nepal.

Nepal Insurance Authority (NIA). (2024). Key indicators of the insurance sector. https://nia.gov.np/stats

Nosurullaev, K. (2024). The necessity of agricultural insurance in developing countries: The ability to adapt to climate changing. Zenodo. DOI: 10.5281/zenodo.15623012

Pandey, K. R., Sapkota, L., Joshi, Y. R., & Chaulagain, J. (2022). Farmers' perception towards crop and livestock insurance in Birendranagar Municipality of Surkhet District: A case study on present status, constraints and potentials for future. *Socio Economy and Policy Studies*, *2*(1), 34-39. DOI: 10.26480/seps.01.2022.34.39

Rokade, N. T. (2016). Knowledge and adoption of beneficiary farmers of crop insurance scheme in Solapur district (Master's thesis). Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India. https://krishikosh.egranth.ac.in/handle/1/5810034974

Sinha, S., & Tripathi, N. K. (2016). Assessing the challenges in successful implementation and adoption of crop insurance in Thailand. *Sustainability*, *8*(12), 1306. DOI: 10.3390/su8121306

Slovic, P. (1987). Perception of risk. Science, 236(4799), 280-285. DOI: 10.1126/science.3563507 PMID: 3563507 PMCID: PMC3404541

Sujarwo, S., & Rukmi, S. M. N. (2018). Factors affecting agricultural insurance acceptability of paddy farmers in East Java, Indonesia. *Jurnal Manajemen & Agribisnis*, 15(2), 143-149. DOI: 10.17358/jma.15.2.143

Swain, M., & Hembram, B. R. (2020). Determinants of adoption of crop insurance: Evidence from Bolangir District in Odisha. *Journal of Land and Rural Studies*, *8*(2), 121-137. DOI: 10.1177/2321024920914767

Ullah, R., Shivakoti, G. P., Kamran, M. A., & Zulfiqar, F. (2019). Land ownership and catastrophic risk management in agriculture: The case of Khyber Pakhtunkhwa Province of Pakistan. *International Journal of the Commons*, *13*(2), 881-891. DOI: 10.5334/ijc.896

World Bank (2019). Nepal: Country diagnostic and investment framework for agricultural risk management and agri-insurance. The WB. Washington, DC.

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