ISSN: 2584-0231(Online)
International Journal of Multidisciplinary Research in Arts, Science and Technology
© IJMRAST | Vol. 4 | Issue 1 | January 2026
Available online at: https://ijmrast.com
DOI: https://doi.org/10.61778/ijmrast.v4i1.217

Agriculture Insurance: A Step towards Agricultural Sustainability and Self-Reliance

Mr. Varun Kumar[1], Prof. (Dr.) Rajinder Kumar Uppal[2]

[1]Research Scholar, SKD University, Hanumangarh (Rajasthan)

[2]Research Guide, Professor Emirates, SKD University, Hanumangarh (Rajasthan)

Corresponding Author Email Id: *varunbajaj80@gmail.com*

ABSTRACT

Agriculture has always been the backbone of rural livelihoods in developing economies, yet it is increasingly exposed to multiple risks arising from climate variability, market uncertainties, and natural calamities. These vulnerabilities often result in income instability, indebtedness, and reduced investment capacity among farmers, thereby threatening long-term agricultural sustainability. In this context, agricultural insurance has been emerged as a critical risk management instrument aimed at protecting farmers against unforeseen losses and enhancing their economic resilience. The present study examines the role of agricultural insurance as a strategic tool for promoting agricultural sustainability and self-reliance. It analyzes how crop insurance schemes contribute to income stabilization, risk mitigation, and improved access to institutional credit, while encouraging the adoption of modern agricultural practices. Using secondary data from government reports, policy documents, and existing empirical studies, the research evaluates the performance of agricultural insurance in strengthening farmers' capacity to withstand production and climate-related shocks. The study highlights the key challenges which constrain the full potential of insurance schemes. The paper concludes with policy recommendations with the aim to improve scheme design, implementation efficiency and farmers participation to ensure inclusive and resilient agricultural development.

Keywords: *Agriculture insurance, Sustainability, Risk management, Rural livelihoods, Self-reliance, Climate resilience.*

Introduction

Agriculture has been the backbone of many developing economies. In countries like India, it supports nearly half of the population directly or indirectly, contributes significantly to the GDP, and ensures national food security. However, agriculture is inherently risky. Weather uncertainties, frequent droughts and floods, rising temperatures, increased pest attacks, and market fluctuations expose farmers to high levels of income instability. Such uncertainty discourages farmers from adopting innovative or sustainable agricultural practices. Inadequate risk management often forces them into cycles of debt and poverty. In this context, agricultural insurance becomes a critical tool for transforming agriculture into a more resilient, sustainable,

and self-reliant sector. Agricultural insurance aims to transfer the risk of financial loss from the farmer to an insurance provider. By compensating for crop failures or livestock losses, insurance enables farmers to recover quickly, maintain productivity, invest in better technologies, and secure household livelihoods.

This paper explores how agricultural insurance contributes to agricultural sustainability and national self-reliance, evaluates its types, identifies challenges, and proposes policy strategies to strengthen the agricultural insurance ecosystem.

Agricultural Risk and Its Impact

Risk is an integral component of agricultural enterprises. The farming sector is highly vulnerable to a range of unpredictable factors- such as climatic variations, fluctuations in yields and market prices, changes in government policies, international market dynamics, and several other external influences -that can significantly alter farm incomes. Consequently, effective risk management requires the adoption of strategies aimed at minimizing the potential financial losses stemming from such uncertainties.

Agricultural risks are generally categorized into five major types: climate risk, price or market risk, financial risk, institutional risk, and human or personal risk**.**

Climatic Risks:

Climatic risks are uncertainties or damages caused by adverse weather events. These are beyond the control of farmers and directly affect crop production. They include drought, flood, cyclones and temperature extremes (heat waves and cold waves)

Market Risk:

Market risks arise from fluctuations in agricultural market conditions. They include - A sudden fall in market prices of crops due to overproduction, poor demand, or market disruptions, leading to low income for farmers. Besides they give rise to demand-supply imbalance when the quantity produced does not match the market demand. If there is excess supply it leads to low prices and if supply is low then farmers cannot meet demand. Both situations affect farmers' earnings.

Financial Risk:

Financial risks relate to money and credit. They include inability to repay loans due to crop loss and It includes concerns such as rising interest rates, sudden tightening of credit by financial institutions, and the overall availability of loan facilities to the agricultural sector. When crops fail due to weather or other hazards, farmers cannot generate enough income to repay the loans they borrowed for farming (seeds, fertilizers, machinery, etc.). This leads to debt burden, financial stress, and dependency on further credit. These risks affect cropping decisions, input use, investment patterns, and long-term sustainability.

Institutional Risk:

This risk is associated with unpredictability in government actions and policy decisions. Modifications in taxation systems, regulations governing chemical usage, guidelines for waste disposal, and changes in price support or income support programs can considerably affect farm performance.

Human or Personal Risk:

It refers to uncertainties linked to the health, safety, and personal circumstances of farmers and their families. Events such as accidents, prolonged illness, death, or family conflicts can disrupt farm operations and threaten the stability of the farming business.

Biological Risks:

These are risks that come from living organisms that damage crops. These risks include pests, diseases and infections caused by fungi, bacteria, or viruses and Weeds.

Operational Risks:

These are risks related to the day-to-day functioning of farming activities like labour shortages, input shortages etc.

Agriculture insurance

Agriculture insurance is a risk-management tool that protects farmers from financial losses caused by natural calamities, pests, diseases, or unexpected events that damage their crops or affect their agricultural income. It is designed to lessen the financial burden and unpredictability that farmers often experience, enabling them to handle their production activities and income in a more secure manner. Its significance has increased further in recent years as climate change and frequent extreme weather events have intensified the challenges for farmers and agro-based sectors. By lowering the financial threats linked to farming, crop insurance contributes to greater stability and sustainable growth within the agricultural industry. Moreover, agricultural insurance also plays a key role in improving farmers' access to credit. Financial institutions are generally more confident in offering loans to farmers who are insured, as the insurance reduces the chances of default. As a result, farmers are better positioned to expand their farms and invest in improved tools, machinery, and modern technologies.

Types of Agricultural Insurance

Agricultural insurance can broadly be categorized as –

Indemnity-Based Crop Insurance:

Indemnity-based crop insurance refers to an agricultural insurance system in which farmers are compensated according to the real damage sustained by their own crops. The payout is calculated after experts evaluate and verify the extent of the loss on the individual farmer's field.

Index-Based Insurance:

Index-based insurance is an insurance model in which compensation is provided according to a fixed, measurable indicator such as recorded rainfall, temperature data, or satellite-based vegetation readings rather than evaluating the actual loss suffered by each individual. This system is widely applied in the agricultural sector, as it allows for quick and impartial payouts during large-scale events like droughts when the index crosses a pre-set trigger value.

Multi-Peril Crop Insurance (MPCI):

Multi-Peril Crop Insurance (MPCI) is an insurance mechanism designed to safeguard farmers from crop losses caused by various natural hazards including drought, hailstorms, frost, pest attacks and plant diseases.

This type of insurance may offer protection solely for reduced crop yields or for both yield and price fluctuations, ensuring farmers have financial security when unexpected events affect agricultural production.

Livestock Insurance:

Livestock Insurance is an insurance scheme that provides financial protection to animal owners against the loss or death of their livestock due to accidents, diseases, natural calamities, or other unforeseen events. This insurance helps farmers and livestock rearers reduce economic risk by compensating them for the value of animals such as cows, buffaloes, goats, sheep, poultry, and other farm animals. It serves as an important tool to ensure stability in income for those who depend on livestock for their livelihood.

Agricultural Inputs Insurance:

This category of insurance offers coverage for agricultural tools, equipment, and machinery. It is particularly designed for farmers involved in activities such as processing and packaging of farm produce.

International Experiences of Agriculture Insurance

It was Benjamin Franklin, who gave the idea of Crop insurance in 1788 when a violent storm destroyed large areas of crops in rural France. Franklin noted that an insurance system for farms could help protect farmers from losses caused by storms, pests, blight, and other natural threats. He suggested that if many farmers contributed a small premium, the collective fund could compensate those who suffered damages, thereby reducing hardship. Although Franklin conceived the idea, the first practical crop insurance schemes emerged later. In the 1820s, France and Germany introduced hail insurance, primarily for grape cultivation. The United States adopted a similar approach in 1883, beginning with insurance for tobacco crops. The first comprehensive Multi-Peril Crop Insurance (MPCI), covering multiple risks, was launched in the United States in 1939 with the establishment of the Federal Crop Insurance Corporation (FCIC) (K.U. Viswanathan, Rural Pulse, NABARD). Then in late 1930s many other countries like Canada, China, and Japan started government sponsored agriculture insurance schemes. Global trends show that technology, targeted subsidies, and strong institutions are key factors behind successful agricultural insurance systems.

In India, it was in 1971-1978 when individual approach of agricultural insurance was introduced by General Insurance Corporation (GIC) for H-4 cotton. Then Pilot Crop Insurance Scheme (PCIS) was launched by GIC under the recommendations of V.N. Dandekar, a renowned Economist of India, in 1979–1985. In 1985 all the previous agriculture insurance programs were replaced by a new scheme named Comprehensive Crop Insurance Scheme (CCIS). In 1999-2000, GoI introduced National Agriculture Insurance Scheme (NAIS) which was implemented by Agriculture Insurance Corporation of India Limited (AIC) in 2003 which was converted to Modified National Agriculture Insurance Scheme (MNAIS) in 2010 with specific amendments and improvements. During the year 2003-04, a lot of private insurance companies like ICICI Lombard, IFFCO-Tokyo came forward and offered their agriculture insurance products in collaboration of AIC. They offered Rainfall Insurance and Weather Based Insurance Scheme which have been running till date. In the year 2016, Department of Agriculture, Cooperation and Family Welfare of GoI introduced Pradhanmantri Fasal Bima Yojna (PMFBY) which is weather based insurance scheme. This scheme is world's largest agriculture insurance scheme. Main postulates of PMFBY are:

1. Launched in the year 2016 by Department of Agriculture, Cooperation & Farmers Welfare (GoI).
2. Stakeholders - Central & State Governments, Banks, CSCs, Insurance Companies, Farmers
3. Lot of portals and apps like Krishi Rakshak Portal, Farmer App, CCE App , AIDE App and Whatsapp Chatbot provide assistance for smooth functioning of the scheme.
4. Includes food crops such as cereals, millets, and pulses, along with oilseeds**,** annual commercial crops**,** and annual horticultural crops**.**
5. Insurance unit is village or gram panchayat.
6. Premium is paid by farmers, state govts. and centre govt. collectively.
7. Maximum premium paid by farmers –

Sr. No.	Season/ Crops	Maximum Premium paid by farmers (% of Sum Insured)
1	Kharif Crops	Maximum 2.0 % of Sum Assured
2	Rabi Crops	1.5 % of Sum Assured
3	Annual Commercial /horticulture crops	5 % of Sum Assured

Source: https://www.pmfby.gov.in/

8. The remaining premium (of sum insured) is paid by state and centre governments in 50-50 proportions.
9. Enrolment is voluntary for all farmers (post Kharif season 2020)
10. Cut-off date for enrolment for each notified crop (the dates may vary from state to state as per local circumstances and weather conditions)

Sr. No.	Kharif Crop	Rabi Crop
1	15th July to 31st July	15th Oct to 31st December

Source: https://www.pmfby.gov.in/

11. Crop loss intimation – within 72 hours of the event occurred via specific apps, toll free number, concerned bank or local agriculture office.
12. Loss assessment – within 10-15 days by the crop loss assessor (appointed within 48 hours of crop loss intimation).
13. Claim settlement – within 2 months (provided that the documentation is completed)

Link between Agriculture Insurance and Agricultural Sustainability

Agricultural sustainability refers to a farming approach that fulfils current food requirements while safeguarding the capacity of future generations to meet theirs. It brings together environmental protection, economic stability, and social well-being. This concept emphasizes the long-term conservation of natural resources through methods such as crop rotation, efficient water use, and enhancement of biodiversity. At the same time, it ensures that agricultural activities remain profitable and uphold ethical standards for farmers, labourers, and the surrounding communities.

In countries like India, where agriculture is exposed to climatic risks, pests, diseases, market fluctuations, and natural disasters, sustainability cannot be achieved without mechanisms that protect farmers from financial shocks. This is where agricultural insurance plays a crucial role. Agricultural sustainability involves eco-friendly, economically sound, and socially responsible farming practices that can be continued over generations.

Agriculture Insurance supports sustainability by reducing farmers' fear of losses, encouraging adoption of climate-resilient technologies, promoting diversified cropping systems, supporting soil conservation and input optimization, providing financial stability to invest in sustainable practices. Agricultural insurance provides support and benefits not only to the farmers but it relieves pressure on the government also. In the absence of agricultural insurance schemes, only the government is obligated to assist farmers in any emergency situation, as governments in every country today have become welfare-oriented. However, in the situation of agricultural insurance, farmers, insurance companies, and the government work together to address unavoidable situations. Agriculture insurance assists agriculture sustainability through:

- Protection against Climate and Weather Risks
- Financial Stability and Risk Reduction for Farmers
- Encouragement for Adopting Improved Agricultural Practices
- Prevents Distress Migration and Supports Rural Economy
- Promotes Environmental Sustainability
- Reduces Dependence on Government Relief Packages
- Strengthens Agricultural Markets and Investments
- Supports Food Security

Thus, Agricultural insurance acts as both a safety net and a development tool by enhancing financial resilience, environmental sustainability, technological adoption, rural economic stability and long-term productivity. Therefore, the link between insurance and agricultural sustainability is strong and multi-dimensional. Agriculture Insurance ensures that agriculture remains economically viable, environmentally responsible, and socially secure, even in the face of climate change and increasing farming risks.

Role of Agricultural Insurance in Attaining Sustainability and Self-Reliance

Self-reliance in agriculture refers to the nation's ability to meet domestic food demand, minimize imports, and maintain stable agricultural growth. Agriculture insurance contributes to the goal of attaining self reliance and sustainability by protecting production process from climate shocks, encouraging investment in high-value and staple crops, reducing dependence on government relief programs, increasing food availability and stabilizing markets. Thus, agricultural insurance indirectly strengthens national food security and economic independence. The role of agriculture insurance in attaining sustainability and self reliance can be reflected through the given heads:

Stabilizing Farm Income

Agricultural insurance provides a guaranteed safety net when crops fail due to drought, flood, pests, diseases, hailstorms, or other calamities. It minimizes financial volatility and protects farmers' livelihoods. Stable incomes encourage long-term investments in modern agriculture practices. It cushions farmers' incomes and prevents sudden economic shocks. Stable income encourages investment in better seeds, fertilizers, and modern technologies. It results in enhanced resilience of farm households—an essential component of sustainable farming. This paves the way to self sufficiency, self reliance and sustainability.

Reduction of Rural Indebtedness

One of the main causes of farmer indebtedness is crop failure. Without insurance, farmers rely on high-interest loans. Insurance claims help them recover losses. Their dependence on informal credit reduces and financial health improves, making them economically self-reliant.

Promoting Climate-Smart Agriculture

Insurance allows farmers to adopt climate-resilient varieties, drip irrigation, organic farming, and other environmentally sustainable methods. As climate extremes increase, insurance acts as a climate adaptation tool since it helps manage risks from rising temperatures, irregular monsoon, and natural disasters. It protects long-term agricultural sustainability by enabling continuity in farming even after severe crop loss.

Facilitating Access to Credit

Financial institutions prefer lending to insured farmers, thereby increasing credit availability. Agricultural insurance acts as a financial bridge between farmers and credit institutions. By mitigating risk, stabilizing income, and enhancing repayment capacity, it enables farmers—especially small and marginal ones—to access timely, affordable, and institutional agricultural credit, which is essential for sustainable rural development.

Encouraging Investment in Farm Technology

Insurance coverage encourages farmers to adopt improved seeds, advanced irrigation systems, precision farming and mechanization. These investments increase productivity and sustainability. When risks are covered, farmers and agro-investors feel more confident about investing in mechanization, high-value crops, organic farming and new technologies like sensors, precision agriculture. This modernization strengthens the entire supply chain and ensures long-term self-reliance.

Enhancing National Food Security and Self-Reliance

A protected agricultural sector ensures stable food production, reducing dependence on imports. Crop insurance ensures uninterrupted food production. Due to agriculture insurance, farmers continue farming in the next season even after crop losses. Thus food availability and affordability are maintained and national agricultural output remains stable. In this way agriculture insurance indirectly contributes to national food security and Atmanirbhar Bharat.

Reducing Pressure on Government Relief Funds

Insurance systems reduce the need for post-disaster compensation, allowing governments to use funds for development instead of emergency relief. Agriculture insurance creates a balanced ecosystem. Agriculture Insurance procedure is based upon Public Private Partnership (PPP) in which major stakeholders are farmers, governments and insurance companies. Farmers pay a subsidized premium, Government supports insurers through compensation and technology and Insurance companies provide scientific risk assessment and speedy settlement. This shared responsibility strengthens resilience and ensures sustainable agricultural development.

Supports Government Policies for Sustainable Development

Agricultural insurance aligns with national goals such as doubling farmers' income, Sustainable Development Goals (SDGs), Climate-resilient agricultural pathways and Atmanirbhar Bharat Abhiyan. By stabilizing the primary sector, it strengthens the entire economy.

Thus, agricultural insurance is not just a protective mechanism—it is a transformational tool. It enhances farmers' financial stability, encourages sustainable farming practices, mitigates climate risks, and supports national self-reliance. By ensuring that farmers continue to produce confidently despite uncertainties, agricultural insurance becomes a foundation for sustainable agriculture, food security, and Atmanirbhar Bharat.

Challenges in Implementing Agricultural Insurance

Although agricultural insurance has significantly improved the condition of farmers and the agricultural system, the sector still faces some challenges that are preventing it from achieving its intended results. Some of the main challenges include:

Low Awareness and Understanding

Farmers often lack knowledge about eligibility, benefits, and claim procedures. Although agricultural insurance schemes have been introduced for more than four decades, farmers still lack a thorough understanding of these schemes and are not fully aware of them. The main reasons for this are illiteracy, the lack of proper publicity about the schemes, and the inability to address misconceptions among farmers. Furthermore, due to technological changes in the last few years, every process has become online, which farmers find difficult to understand.

Basis Risk in Index Insurance

Basis risk refers to the possibility that the compensation received by farmers under an index-based insurance scheme does not accurately reflect their actual losses**.** In other words, a farmer may suffer heavy damage to crops but still receive little or no payout because the predefined index (such as rainfall level, temperature, or yield data) does not show a significant deviation. Conversely, payouts may sometimes be triggered even when a particular farmer has experienced minimal loss. This mismatch arises because index insurance relies on generalized indicators, not on direct assessment of individual farm damage. A survey on 225 farmers in district Fatehabad, Haryana revealed that weather index may not represent actual losses, causing dissatisfaction among the farmers.

High Premiums and Affordability Issues

Small and marginal farmers may find insurance expensive without subsidies. Although the insurance premiums under current agricultural insurance schemes are jointly paid by farmers and governments, it remains difficult for small farmers to pay their insurance premiums. Approximately 85% of farmers in the country still fall into the category of small and marginal farmers, owning 2 hectares or less of land. They find it extremely difficult to pay their insurance premiums.

Delayed Claim Settlements

Poor data availability or administrative delays reduce trust among farmers. One of the biggest problems with agricultural insurance is the often delay in disbursing compensation to farmers in the event of crop loss. According to a 2024 survey, approximately 56% of farmers felt that compensation for crop loss was either disbursed too late or too little. They are of the opinion that the insurance premium is paid on time but the compensation is never paid on time. This discourages farmers from opting for crop insurance.

Limited Institutional Capacity

According to a survey it is found that there is weak coordination between insurance companies, banks, and agricultural departments. Most of the farmers believe that the government and insurance companies lose coordination when it comes to compensating for crop loss. They blame each other for the failure to pay compensation on time. Farmers believe that insurance companies participate in these schemes solely for their own benefit, not for the interests of farmers.

Inadequate Weather and Yield Data

Lack of long-term data hampers accurate index design. Inadequate weather and yield data weakens the core objective of agriculture insurance, which is to provide timely and accurate compensation to farmers. Many agricultural districts still lack a sufficient number of Automated Weather Stations (AWS) and rain gauges. As a result, weather-related events—such as excess rainfall, drought, hailstorms, or temperature fluctuations—may not be measured accurately at the local level. This leads to difficulties in determining the actual extent of crop damage.

Moral Hazard and Adverse Selection

Moral hazard and adverse selection pose significant challenges to the effective functioning of agricultural insurance schemes. Moral hazard occurs when farmers alter their behaviour after obtaining insurance, becoming less vigilant in crop management because they feel financially protected against potential losses. This may include neglecting essential agricultural practices such as proper irrigation, pest management, or timely use of inputs, which increases the likelihood of claims and raises the overall cost of insurance. Adverse selection, on the other hand, arises when farmers who face a higher probability of crop failure—such as those in drought-prone or flood-prone areas—are more likely to purchase insurance, while low-risk farmers often opt out. This imbalance leads to a concentration of high-risk individuals in the insurance pool, resulting in higher claim payouts and escalating premiums, which further discourages participation from low-risk farmers. Together, these issues undermine the financial sustainability and risk-sharing objectives of agricultural insurance, making it difficult for insurers to price premiums accurately and maintain the long-term viability of the schemes. Implementing improved monitoring systems, promoting awareness, and using advanced technologies such as remote sensing and satellite-based assessment are essential to mitigate these challenges.

Policy Recommendations

A robust and inclusive agricultural insurance system is essential for safeguarding farmers against climatic uncertainties, price instability, and production risks. Although various schemes—such as the Pradhan Mantri

Fasal Bima Yojana (PMFBY)—have made significant progress, several structural and operational improvements are still required to ensure wider adoption, transparency, and sustainability. The following suggestions and policy recommendations aim to strengthen the agricultural insurance framework and enhance its effectiveness:

Strengthening Awareness and Capacity Building

A considerable number of farmers remain unaware of insurance benefits, enrolment procedures, or claim processes. Government agencies, agricultural universities, extension workers, and local institutions should jointly conduct regular training programs, village-level workshops, and demonstration camps to improve understanding of crop insurance. Besides, all policy documents, enrolment forms, and guidelines should be made available in local languages. Simple, farmer-friendly communication materials—posters, audio-visual content, and mobile-based messages—can help overcome information barriers.

Improving Enrolment and Accessibility

Kisan Service Centres, mobile vans, and digital platforms should allow farmers to enroll without relying solely on banks or intermediaries. Integration with Kisan Credit Cards (KCC) can also simplify automatic enrolment. Besides, special provisions must be introduced to include landless cultivators, tenant farmers, and sharecroppers by accepting alternative documents such as lease agreements, self-declarations, or verification by panchayat authorities.

Enhancing Transparency and Accountability

Satellite imagery, drone surveys, and remote sensing tools should be used for accurate yield estimation. Integrating these systems with a centralized digital platform will reduce disputes and ensure transparent claim calculation. Besides, there should be public disclosure of scheme's performance. Insurance companies should regularly publish district-wise data on premiums collected, claims processed, settlement timelines, and pending cases. This will build trust among farmers and strengthen accountability.

Fast and Fair Claim Settlement

Strict timelines must be enforced for conducting crop-cutting experiments (CCEs), assessing damage, and releasing compensation. Penalties should be imposed on agencies that delay claim settlement. Besides, there should be adoption of Weather-Indexed and Area-Indexed Models. Using automatic weather stations and index-based insurance can reduce dependency on manual assessments, speeding up the compensation process and minimizing disputes. Compensation should be transferred directly to farmers' bank accounts through DBT to eliminate delays and reduce financial leakages.

Rationalizing Premium Structure

There should be adjustment in premium rates. Premiums should be adjusted according to risk zones, crop types, and historical yield data. High-risk districts may receive additional government support to maintain affordability. Besides, marginal and small farmers should receive increased premium subsidies, while wealthier agricultural producers may be encouraged to adopt commercial insurance options.

Strengthening Public Private Partnerships and Institutional Coordination

There should be more coordination and collaboration among governments, banks and private insurance companies. Introducing competition among insurance providers can lead to better service quality, wider coverage, and more innovative insurance products. Besides partnerships with technology firms may prove helpful to enhance the productivity of agriculture insurance schemes. Tech companies can support real-time monitoring, digital claim filing, risk modelling, and weather forecasting—improving both accuracy and efficiency. Village-level committees should help verify crop loss, authenticate farmer claims, and assist in awareness generation.

Introducing Customized and Flexible Insurance Products

Insurance offerings should consider regional cropping patterns, water availability, and climatic variations. Customized policies can improve relevance and adoption. Besides, policies must cover not only droughts, floods, and pests but newer risks such as market price shocks, input cost fluctuations, and post-harvest losses also.

Promoting Risk Mitigation Practices alongside Insurance

Farmers adopting sustainable practices—such as drip irrigation, soil conservation, drought-tolerant seeds, or integrated pest management—should receive lower premium rates. Besides, there is dire need of linking insurance with early warning systems. Timely weather warnings and advisory services can minimize damage and reduce claim burden.

Continuous Evaluation and Policy Reforms

Periodic studies should be conducted by research institutions and universities to evaluate scheme performance, identify gaps, and propose evidence-based reforms. A grievance redressal portal and toll-free helpline should be available for farmers to report issues, track claim status, and provide feedback on the insurance system.

Conclusion

A well-structured agricultural insurance system acts as a foundation for rural stability, farmer welfare, and long-term agricultural sustainability. By embracing technology, improving transparency, simplifying enrolment, and ensuring timely claim settlement, the insurance framework can become more reliable and farmer-centric. Implementing these recommendations will not only enhance risk protection but also contribute significantly to self-reliance, resilience, and inclusive agricultural growth. Agricultural insurance plays a crucial role in building a resilient farming system. By mitigating the impacts of climate change, stabilizing farm incomes, and promoting investments in modern technology, insurance directly supports sustainable agricultural development. Additionally, by reducing dependence on imports and enabling increased domestic production, agricultural insurance strengthens national self-reliance.

However, insurance alone cannot transform agriculture. It must operate alongside improved irrigation, high-quality seeds, credit access, extension services, and market reforms. A well-coordinated, transparent, and technology-driven insurance ecosystem can empower farmers, protect livelihoods, and build a sustainable and self-reliant agricultural economy.

References

[1]. Agriculture Insurance Company of India Ltd. (2017). *Annual report*. https://www.aicofindia.org

[2]. Comptroller and Auditor General of India. (2017). *Performance of agriculture crop insurance schemes* (Report No. 7 of 2017). Government of India.

[3]. Department of Agriculture and Cooperation, Agricultural Census Division. (2017). *Agricultural census*. Government of India.

[4]. Food and Agriculture Organization. *Reports on agricultural risk management*. FAO.

[5]. Government of India. (2016). *Pradhan Mantri Fasal Bima Yojana (PMFBY) guidelines*. Ministry of Agriculture and Farmers Welfare.

[6]. Government of India, Ministry of Agriculture and Farmers Welfare. *PMFBY annual reports*. Government of India.

[7]. Hazell, P., & Varangis, P. (2019). *Best practices for index-based insurance*. World Bank.

[8]. Indian Express. (2020). *Explained: How crop insurance changes*. https://indianexpress.com

[9]. Indian Express. (2020). *PMFBY 2.0: A revamped crop insurance scheme*. https://indianexpress.com

[10]. Irshad, M. (2017). Agricultural risk and crop insurance in India: An analysis of public and private sector involvement in crop insurance. *Clanci*, 4, 46–53.

[11]. Jain, R. C. A. (2004). Challenges in implementing agricultural insurance and reinsurance in developing countries. *The Journal*, 14–23.

[12]. Jha, S., & Kumar, S. (2020). Assessing the impact of crop insurance on farmers' income stability in Haryana. *Economic Affairs*, 65(1), 73–84.

[13]. Joshi, S., & Mehta, P. (2017). Crop insurance schemes and farmers' satisfaction: A study from Gujarat. *Indian Journal of Extension Education*, 53(3), 101–108.

[14]. Kaur, S., & Singh, M. (2019). Role of banks in crop insurance implementation: Challenges and solutions. *Banking and Finance Review*, 34(4), 411–424.

[15]. Kumar, R., & Singh, S. (2019). Evaluation of crop insurance schemes in India: A case study of PMFBY. *Journal of Agricultural Policy and Research*, 4(1), 23–38.

[16]. Madhvi, S. (2012). Haryana implements weather-based crop insurance scheme. *The Economic Times*.

[17]. Mahul, O., & Stutley, C. (2010). *Government support to agricultural insurance: Challenges and options for developing countries*. World Bank.

[18]. Muniraju, Y. (2018). Crop insurance: Farmers' perception and awareness—A study with special reference to Kodagu district. *International Journal of Research in Economics and Social Sciences*, 8(2).

[19]. Nagaraj, K. (2017). *Farmers' suicides in India: Magnitudes, trends and spatial patterns* (Research Report). Madras Institute of Development Studies.

[20]. Singh, R. S. (2018). *Performance of Pradhan Mantri Fasal Bima Yojana in Uttar Pradesh*. Ministry of Agriculture and Farmers Welfare.

[21]. Sona, H. C., & Muniraju, Y. (2018). Status of crop insurance in India: A study with reference to Kodagu district of Karnataka state. *International Journal of Management Studies*, 5(3), 1–9.

[22]. Swain, M., & Hembram, R. B. (2020). Determinants of adoption of crop insurance: Evidence from Bolangir district in Odisha. *Journal of Land and Rural Studies*, 8(2), 121–137.

[23]. The Wire. (2019). Crop insurance: Private companies earn ₹3,000 crore profit while state ones in loss. *The Wire*.

[24]. United Nations Development Programme. (2016). *Human development report 2016*. https://hdr.undp.org/en/

[25]. World Bank. (2020). *Agriculture and climate risk reports*. World Bank.

[26]. MyGov. (n.d.). *Pradhan Mantri Fasal Bima Yojana (PMFBY)*. https://www.mygov.in/campaigns/pmfby/

Cite this Article

Mr. Varun Kumar, Prof. (Dr.) Rajinder Kumar Uppal, "Agriculture Insurance: A Step towards Agricultural Sustainability and Self-Reliance", ***International Journal of Multidisciplinary Research in Arts, Science and Technology (IJMRAST)****, ISSN: 2584-0231, Volume 4, Issue 1, pp. 01-13, January 2026.*

Journal URL: *https://ijmrast.com/*

DOI: *https://doi.org/10.61778/ijmrast.v4i1.217*