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Agricultural Insurance in India: Government Initiatives, Innovations and the Road Ahead

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INTRODUCTION

Agriculture remains the backbone of the Indian economy, supporting the livelihoods of nearly half of the country's population. However, the sector is highly vulnerable to a wide range of risks, including climate change, erratic weather conditions, pest and disease outbreaks, market fluctuations, natural disasters, and rising input costs. These uncertainties often result in significant income losses for farmers, threatening agricultural productivity and rural livelihoods. Agricultural insurance has emerged as a vital risk management tool that provides financial protection against such unforeseen events, enabling farmers to recover from losses and continue agricultural operations. Over the years, India has developed a comprehensive agricultural insurance framework through progressive government initiatives, technological innovations, and digital transformation. This article discusses the evolution of agricultural insurance in India, major government schemes, emerging digital innovations, and future prospects, while highlighting the role of InsurTech solutions such as GramCover in creating a more inclusive, transparent, and farmer-centric agricultural insurance ecosystem.

Agricultural Risks in India

Indian agriculture is exposed to a wide range of production, climatic, biological, and economic risks that threaten farmers' livelihoods and agricultural sustainability. These interconnected risks highlight the critical need for comprehensive agricultural insurance and effective risk management strategies to ensure sustainable agricultural development and farmers' livelihood security. The major agricultural risks include:

- **Climate risks:** Droughts, floods, cyclones, hailstorms, heat waves, frost, and unseasonal rainfall.
- **Weather variability:** Erratic monsoon, delayed onset of rains, prolonged dry spells, and temperature fluctuations.
- **Pest and disease outbreaks:** Crop losses due to insects, plant diseases, weeds, and invasive species.
- **Market risks:** Price volatility, low market prices, changing consumer demand, and unstable agricultural markets.
- **Production risks:** Low crop yields resulting from adverse weather, poor-quality inputs, or technological failures.
- **Input cost risks:** Rising prices of seeds, fertilizers, pesticides, labour, fuel, and irrigation.
- **Post-harvest risks:** Losses during harvesting, storage, transportation, and marketing.
- **Financial risks:** Limited access to institutional credit, indebtedness, and inadequate working capital.
- **Livestock and aquaculture risks:** Animal diseases, mortality, epidemics, and losses in fisheries and aquaculture.
- **Policy and institutional risks:** Changes in government policies, subsidy structures, trade regulations, and insurance implementation.
- **Natural disasters:** Earthquakes, landslides, lightning, and other extreme events causing widespread agricultural damage.
- **Climate change impacts:** Increasing frequency and intensity of extreme weather events, threatening agricultural productivity and farmers' incomes.
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Evolution of Crop Insurance in India

Crop insurance in India has evolved significantly over the past seven decades, progressing from experimental programmes to a comprehensive, technology-driven risk management system. India's crop insurance system is moving towards a **digital, technology-enabled, climate-resilient, and farmer-centric risk management framework**, ensuring greater transparency, wider coverage, and timely compensation. The major milestones are as follows:

- **1947–1971 (Evolution Phase):** Initial discussions and research on the need for crop insurance in India, leading to the development of conceptual insurance models.
- **1972–1978:** Launch of the **First Crop Insurance Scheme (FCIS)** on an experimental basis.
- **1979–1984:** Introduction of the **Pilot Crop Insurance Scheme (PCIS)** to expand insurance coverage.
- **1985–1999:** Implementation of the **Comprehensive Crop Insurance Scheme (CCIS)**, covering farmers availing institutional crop loans.
- **1999–2011:** Launch of the **National Agricultural Insurance Scheme (NAIS)** with wider crop and farmer coverage.
- **2007–2015:** Introduction of the **Weather Based Crop Insurance Scheme (WBCIS)** to provide quicker compensation based on weather parameters.
- **2011–2015:** Implementation of the **Modified National Agricultural Insurance Scheme (MNAIS)** with improved coverage and claim settlement mechanisms.
- **2016:** Launch of the **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, replacing NAIS and MNAIS with affordable premiums and comprehensive risk coverage.
- **2016–Present:** Expansion of the **Restructured Weather Based Crop Insurance Scheme (RWBCIS)** and integration of advanced technologies such as satellite imagery, drones, artificial intelligence (AI), remote sensing, the National Crop Insurance Portal (NCIP), CROPIC, and WINDS for efficient crop monitoring and faster claim settlement.

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PMFBY: Key Features and Coverage

The **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, launched on **18 February 2016**, is India's flagship crop insurance scheme aimed at providing comprehensive financial protection to farmers against crop losses caused by natural calamities, adverse weather conditions, pests, and diseases. The scheme covers **food crops, oilseeds, commercial crops, and horticultural crops**, ensuring affordable insurance with substantial premium support from the Central and State Governments. PMFBY has significantly strengthened India's agricultural risk management system by reducing farmers' financial vulnerability, promoting investment in modern agriculture, ensuring timely compensation, and enhancing resilience against climate change and weather-related uncertainties.

Key Features of PMFBY

- Launched by the **Government of India** in **2016**.
- Replaced the **National Agricultural Insurance Scheme (NAIS)** and **Modified National Agricultural Insurance Scheme (MNAIS)**.
- Covers **food grains, oilseeds, commercial, and horticultural crops**.
- Affordable farmer premium:
  - **2%** for Kharif crops
  - **1.5%** for Rabi crops
  - **5%** for commercial and horticultural crops
- Remaining premium is **shared by the Central and State Governments**.
- Uses an **Area Approach** for yield assessment, with **individual farm assessment** for localized calamities and post-harvest losses.
- Provides **cashless, technology-enabled, and transparent claim settlement**.
- Integrates digital technologies such as **National Crop Insurance Portal (NCIP), Artificial Intelligence (AI), satellite imagery, drones, GPS, remote sensing, CROPIC, and WINDS** for crop monitoring and damage assessment.

Coverage under PMFBY

The scheme provides comprehensive protection throughout the crop production cycle by covering:

- **Prevented Sowing/Germination:** Compensation when crops cannot be sown due to adverse weather conditions.
- **Standing Crop (Mid-Season Adversity):** Coverage against yield losses caused by drought, floods, cyclones, pests, diseases, and other natural calamities.
- **Localized Calamities:** Protection against losses due to hailstorms, landslides, inundation, cloudbursts, and other localized disasters affecting individual farms.
- **Post-Harvest Losses:** Coverage for harvested crops damaged by cyclones, unseasonal rainfall, storms, or similar events for up to **14 days after harvesting**.

Types of Agricultural Insurance Schemes in India

1. **Weather-Based Crop Insurance (RWBCIS):** The **Restructured Weather Based Crop Insurance Scheme (RWBCIS)** is an innovative insurance programme that provides financial protection to farmers against crop losses resulting from adverse weather conditions. Unlike conventional crop insurance, RWBCIS determines compensation based on predefined weather parameters such as rainfall, temperature, humidity, wind speed, and hailstorms rather than actual crop yield. This approach enables **quicker, objective, and transparent claim settlement**, reducing delays in compensation.

Key Features of RWBCIS

- Provides insurance against **weather-related risks** affecting crop production.
- Covers **food crops, oilseeds, commercial crops, fruits, and vegetables**.
- Compensation is based on **weather indices** rather than individual crop loss assessment.

- Covers risks such as **deficit/excess rainfall, high or low temperature, humidity, wind speed, hailstorms, and cloudbursts**.
- Enables **faster claim settlement** using data from Automatic Weather Stations (AWS).
- Reduces subjectivity through **scientific weather-based assessment**.
- Complements **PMFBY** in areas where weather-index insurance is more suitable.
- Promotes climate-resilient agriculture by reducing weather-related production risks.

2. **Mukhyamantri Kisan Sahay Yojana (MKSY), Gujarat:** The **Mukhyamantri Kisan Sahay Yojana (MKSY)** is a farmer welfare initiative of the **Government of Gujarat** that provides financial assistance to farmers suffering crop losses due to natural calamities. Unlike premium-based insurance schemes, MKSY offers **direct financial assistance without charging any premium**, thereby reducing the financial burden on farmers and strengthening their resilience against climatic disasters.

Key Features of MKSY

- Implemented by the **Government of Gujarat** for financial support to farmers affected by natural disasters.
- **No insurance premium** is payable by farmers.
- Financial assistance is provided only when **crop losses are caused by notified natural calamities**.
- Assistance is available for a maximum of **4 hectares** of agricultural land.
- Crop losses must be **certified by the Revenue Department**.
- Financial assistance includes:
  - **₹20,000 per hectare** for **33–60% crop loss**.
  - **₹25,000 per hectare** for **more than 60% crop loss**.
- Supports farmers in recovering from disasters and continuing agricultural operations.
- Complements national crop insurance schemes by providing additional state-level protection to farmers.

3. **Livestock Insurance:** Livestock insurance is an important component of agricultural risk management that provides financial protection against the loss of economically valuable animals due to disease, accidents, natural calamities, or death. The scheme supports dairy farmers and livestock rearers by minimizing financial losses and ensuring livelihood security. The sum insured is generally based on the market value of the animal, while the premium is partially subsidized by the Government.

Key Features of Livestock Insurance

- Provides insurance coverage for **cattle, buffaloes, sheep, goats, pigs, horses, and poultry**.
- Covers losses due to **diseases, accidents, natural disasters, and animal mortality**.
- Sum insured is based on the **current market value** of the animal.
- Premium is **partially subsidized** by the Central and State Governments.
- Protects farmers' investment in livestock and dairy enterprises.
- Promotes scientific livestock management and improves rural livelihood security.
- Encourages institutional credit and investment in the livestock sector.

4. Aquaculture Insurance under PMMSY: The Pradhan Mantri Matsya Sampada Yojana (PMMSY), launched in 2020, is a flagship programme of the Government of India for the sustainable development of the fisheries and aquaculture sector. As part of the scheme, aquaculture insurance provides financial protection to fish and shrimp farmers against production losses caused by diseases, natural calamities, environmental hazards, and other unforeseen events. The scheme also promotes scientific aquaculture, enhances farmers' income, and strengthens the resilience of the fisheries sector.

Key Features of Aquaculture Insurance under PMMSY

- Provides insurance coverage for fish, shrimp, and other aquaculture enterprises.

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- Covers losses due to disease outbreaks, floods, cyclones, water quality deterioration, and other natural disasters.
- Supports fish ponds, hatcheries, cages, raceways, and aquaculture infrastructure.
- Encourages adoption of scientific and commercial aquaculture practices.
- Provides government support and subsidy for eligible beneficiaries.
- Reduces production risks and promotes sustainable fisheries development.
- Improves income security and investment confidence among fish farmers.
- Contributes to the Blue Economy by strengthening India's fisheries and aquaculture sector.

5. Unified Package Insurance Scheme (UPIS): The **Unified Package Insurance Scheme (UPIS)** is a comprehensive insurance initiative introduced by the Government of India to provide multiple insurance covers under a single policy. Unlike standalone crop insurance, UPIS offers holistic risk protection by covering crops, livestock, agricultural assets, personal accidents, and life insurance. The scheme aims to simplify insurance services, reduce farmers' financial vulnerability, and ensure comprehensive risk management for farming households.

Key Features of UPIS

- Integrates **multiple insurance products** under a single umbrella policy.
- Provides **crop insurance** against yield losses caused by natural calamities, pests, and diseases.
- Covers **livestock insurance** for protection against animal mortality due to accidents, diseases, and natural disasters.
- Includes **personal accident insurance** for farmers and their families.
- Offers **life insurance** to provide financial security in unforeseen circumstances.
- Covers **agricultural assets** such as farm equipment, pumpsets, and other productive assets (where applicable).
- Simplifies insurance enrolment and claim procedures through a **single policy framework**.
- Reduces the financial burden on farmers by providing **comprehensive risk coverage**.
- Enhances farmers' resilience against multiple agricultural and livelihood risks.
- Promotes **sustainable agriculture, financial inclusion, and rural livelihood security** through integrated risk management.

Digital Transformation in Agricultural Insurance

Digital technologies are revolutionizing agricultural insurance in India by making insurance services more transparent, accurate, efficient, and farmer-friendly. The integration of artificial intelligence (AI), satellite imagery, drones, remote sensing, weather analytics, and digital platforms has significantly improved farmer enrolment, crop monitoring, damage assessment, and claim settlement. These innovations have reduced manual interventions, enhanced transparency, minimized disputes, and enabled faster delivery of insurance benefits to farmers. The digital transformation of agricultural insurance is creating a faster, more transparent, and technology-driven risk management system, strengthening farmers' confidence and improving the overall effectiveness of crop insurance programmes in India.

Key Digital Initiatives in Agricultural Insurance

- **National Crop Insurance Portal (NCIP):** A unified digital platform for farmer enrolment, premium payment, policy management, claim processing, and monitoring of crop insurance schemes.
- **Artificial Intelligence (AI):** AI-powered analytics support crop yield prediction, risk assessment, fraud detection, and faster claim verification.
- **Drone Technology:** Drones capture high-resolution field images for rapid and accurate crop damage assessment,

reducing dependence on manual inspections.

- **Satellite Imagery and Remote Sensing:** Continuous monitoring of crop growth, acreage, vegetation health, and disaster impacts over large geographical areas.
- **CROPIC (Collection of Real-Time Observations & Photo of Crops):** A mobile application that captures geo-tagged photographs of crops at different growth stages for transparent and evidence-based claim assessment.
- **WINDS (Weather Information and Network Data Systems):** Provides hyper-local weather data for weather-based crop insurance, improving risk assessment and claim settlement.
- **Automatic Weather Stations (AWS):** Supply real-time weather data for accurate implementation of weather-index insurance schemes.
- **Mobile Applications:** Enable farmers to enrol in insurance schemes, report crop losses, upload geo-tagged photographs, track claim status, and receive real-time updates.
- **GPS and GIS Technologies:** Improve field mapping, crop identification, and location-specific monitoring for accurate insurance administration.
- **Big Data Analytics:** Supports premium pricing, risk forecasting, policy planning, and evidence-based decision-making.

Emerging Trends and Future Prospects of Agricultural Insurance in India

Agricultural insurance in India is rapidly evolving from a traditional compensation mechanism to a **technology-driven, farmer-centric, and climate-resilient risk management system**. The growing frequency of climate-induced disasters, coupled with advancements in digital technologies, is reshaping the design and delivery of insurance products. Innovations such as artificial intelligence (AI), remote sensing, satellite imagery, drones, big data analytics, and weather-based insurance models are improving risk assessment, accelerating claim settlement, and enhancing transparency. With continued policy support and technological integration, agricultural insurance is expected to play a pivotal role in strengthening farmers' resilience, ensuring income security, and promoting sustainable agricultural development.

Emerging Trends of Agricultural Insurance in India

- **Digitalization of insurance services** through the National Crop Insurance Portal (NCIP) and mobile applications.
- **Integration of Artificial Intelligence (AI) and Machine Learning (ML)** for crop monitoring, yield prediction, and fraud detection.
- **Greater use of drones, satellite imagery, and remote sensing** for real-time crop health monitoring and damage assessment.
- **Expansion of weather-index and parametric insurance products** for faster and objective claim settlements.
- **Use of big data analytics and GIS technologies** for scientific risk assessment and premium pricing.
- **Increasing adoption of geo-tagging and mobile-based claim reporting** to improve transparency.
- **Growing participation of AgriTech startups and InsurTech companies** in developing innovative insurance solutions.
- **Expansion of insurance coverage** beyond crops to include livestock, fisheries, horticulture, and farm assets.
- **Greater collaboration among governments, insurance companies, financial institutions, and Farmer Producer Organizations (FPOs)** to improve insurance outreach.
- **Promotion of customized and region-specific insurance products** based on local cropping systems and climatic conditions.

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Future Prospects of Agricultural Insurance in India

- **Universal insurance coverage** for all eligible farmers, including tenant farmers and sharecroppers.
- **Faster and transparent claim settlement** through fully digital and automated assessment systems.
- **Integration of climate-smart agriculture with insurance** to enhance resilience against climate change.
- **Strengthening financial inclusion** by linking insurance with institutional credit and digital payment systems.
- **Enhanced farmer awareness and financial literacy** through targeted extension programmes and digital platforms.
- **Development of affordable and customized insurance products** for diverse agricultural enterprises.
- **Improved public-private partnerships** to increase efficiency, innovation, and insurance penetration.
- **Policy reforms** aimed at simplifying enrolment procedures and improving grievance redressal mechanisms.
- **Contribution to the vision of Viksit Bharat 2047** by ensuring stable farm incomes, sustainable agricultural growth, and resilient rural livelihoods.

GramCover: A Rural InsurTech Success Story

GramCover is a leading Rural InsurTech company founded in 2017 to make insurance accessible, affordable, and convenient for rural India. Headquartered in Gurugram, Haryana, it leverages digital technology and partnerships with insurers, banks, microfinance institutions (MFIs), agri-businesses, fintech firms, and Farmer Producer Organizations (FPOs) to expand insurance access among rural communities. The company offers crop, livestock, health, motor, and personal accident insurance through a technology-enabled platform that simplifies policy enrolment, premium payments, and claim settlement. By promoting paperless and transparent insurance services, GramCover has improved insurance penetration while reducing operational costs and claim processing time. Its success demonstrates the growing role of InsurTech in building a more inclusive, efficient, and farmer-centric agricultural insurance ecosystem for resilient agriculture and sustainable rural development.

Key Features of GramCover

- Established in **2017** as a rural-focused InsurTech platform.
- Headquartered in **Gurugram, Haryana**.
- Provides **crop, livestock, health, motor, and personal accident insurance**.
- Focuses on **farmers and underserved rural communities**.
- Partners with **insurance companies, banks, MFIs, agri-businesses, fintech companies, and FPOs**.
- Offers **digital policy enrolment, premium payment, and claim settlement**.
- Promotes **paperless, transparent, and technology-driven insurance services**.
- Improves insurance penetration in rural areas through local partner networks.
- Supports financial inclusion and rural livelihood security.
- Demonstrates how **digital innovation can strengthen agricultural risk management and expand insurance access** in India.

CONCLUSION

Agricultural insurance plays a crucial role in protecting farmers from climatic, biological, and market-related risks while strengthening agricultural resilience. Government initiatives, digital technologies, and emerging InsurTech platforms such as GramCover are making insurance more accessible, transparent, and efficient. Continued collaboration among governments, insurers, technology providers, and Farmer Producer Organizations (FPOs) will further expand insurance coverage, enhance farmers' income security, and support climate-resilient agriculture, sustainable rural development, and the vision of **Viksit Bharat 2047**.

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