

# Agricultural Insurance for Agricultural Development in India: Issues and Experience

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## **Abstract:**

*Farming is the foundation of the Indian economy, with two-thirds of the population depending on it for their livelihood. Only 40 percent of agricultural land in India is irrigated, while the rest is exposed to unpredictable weather patterns. As a result, agriculture is vulnerable to various risks and highly dependent on the weather. Crop yields and farmer incomes in India often suffer from natural disasters like droughts, floods, cyclones, storms, landslides, earthquakes, etc. The susceptibility of farming to these calamities is intensified by disease outbreaks and human-induced disasters such as fires, sale of counterfeit seeds, fertilizers and pesticides, price crashes, etc. All these events severely impact farmers through loss of yield and income, and are beyond their control. With the increasing commercialization of agriculture, the magnitude of loss due to adverse events is rising. But agricultural insurance is seen as an important mechanism to effectively address the risks to output and income arising from various natural and man-made events.*

**Key Words:** *Crop Insurance, Diversification, Specialisation, Risk sharing.*

## **Introduction**

In India, only 40% of agricultural land has access to irrigation. The other 60% is vulnerable to unpredictable weather patterns. Crop insurance can shield farmers from losses stemming from natural calamities like droughts, floods, hailstorms, infestations, disease, and other types of crop damage. Insurance lowers the financial jeopardy and doubt farmers face. It assists them in better managing output and income. Insurance is even more crucial as climate change results in more extreme weather occurrences. By reducing financial risk in agriculture, crop insurance encourages stability and growth. Furthermore, insurance enhances credit availability. Lenders may extend more credit to insured farmers. This enables farmers to broaden and invest in tools or technology.

Increasing understanding and capabilities regarding agricultural insurance requires ongoing efforts by all stakeholders. Local partnerships can enhance knowledge and skills for sustainable development and use of climate risk and agricultural insurance. Promoting collaboration between insurers, aggregators, governments and other stakeholders can also help to form an inclusive insurance market and accelerate provision of risk management solutions for farmers and agribusinesses. Integrating agricultural insurance with other financial and non-financial

services across the agricultural value chain, such as credit, inputs and produce marketing can also boost insurance adoption by making it more tangible. Government policy plays a crucial role in agricultural insurance by making insurance products more available and affordable through public-private partnerships, subsidies, risk-sharing programs and supportive regulations. This supports agricultural productivity while reducing financial risks for farmers and agribusinesses.

## Review of Literature

In a recent study by **Ahsan et al (1982)** public subsidies are necessary for agricultural insurance to be viable. The core principle of insurance is distributing risk. This can be accomplished in two main ways: risk spreading and risk pooling. Risk spreading involves individuals with potentially different risk attitudes sharing the same risk, like in a crop-sharing agreement. In standard insurance models that isolate risk spreading from risk pooling, an individual shares a specific risk with an insurance company. The individual is assumed to be risk averse, while the insurance company is assumed to be risk neutral. Risk pooling refers to a situation where individuals with different risks put their risks in a common pool that they all share. For example, insurance may be provided collectively to a group with members who face varying probability distributions of loss. The benefits of pooling risk in insurance can potentially reduce the variance of total loss, which in turn lowers premiums. The law of large numbers is usually cited to justify the existence of such benefits from risk pooling.

**Walker and Jodha (1986)** expressed the opinion that when there are no formal mechanisms for sharing or diffusing risk, farmers depend on traditional ways and means to manage production risk in agriculture. Many crop strategies and farming practices have been adopted in the absence of crop insurance to stabilize crop revenue. The availability and effectiveness of these risk management strategies or insurance substitutes depends on public policies and the demand for crop insurance.

**Rao et al. (1988)** indicate that farmers in semi-arid tropical areas have a very restricted capacity to handle risk. Farmers who are wealthier or have large families can reduce risk in different ways over time and location. For example, they might depend on stored grain or savings to get through tough years, or diversify production across various plots. With greater financial endurance, farmers may prioritize higher yields or profits on average over time, even if this leads to high variability in output from year to year.

After analyzing the risk in agricultural investments, the risk-avoiding tendencies of farmers, and possible strategies for transferring risk, **Binswanger (1980)** concludes that in arid and semi-arid areas, farmers' own methods for managing losses or dispersing risk are very costly.

The study by **Ahsan et al., (1982)** stated that the main purpose of insurance plans is to reimburse risk-averse individuals who may be adversely affected by natural chance events. The principles forming the basis of the insurance industry depend on the law of large numbers, where the occurrence of risk is spread across numerous

people. By offering a way to transfer risks, insurance allows individuals to engage in risky undertakings that they would shun if insurance was not available.

**Jodha's (1981)** study argues that in semi-arid tropical regions of India, farmers' attempts to mitigate risks in agriculture were expensive and largely ineffective for managing risk and adapting to drought and scarcity. He finds that the inherent riskiness of farming in these areas negatively impacts agricultural investment, leading to suboptimal resource allocation. Additionally, Jodha finds that official credit institutions are poorly equipped to reduce Indian farmers' vulnerability to agricultural risks, as they fail to provide consumption loans to farmers affected by drought.

**Bhende (2002)** discovered that a well-designed and executed crop insurance program would protect the many vulnerable small and marginal farmers from hardship. It would also bring stability to farm incomes and boost farm production. With crop insurance, farmers are more likely to allocate resources to maximize profits.

According to research conducted by **Horowitz and Lichtenberg in 1993**, crop insurance has a major impact on the decisions of maize farmers in the US Midwest regarding their use of chemicals. The study found that farmers who purchased crop insurance used substantially more nitrogen per acre (19% more), spent considerably more money on pesticides (21% more), and treated more acreage with both herbicides and insecticides (7% more acreage with herbicides and 63% more with insecticides) compared to farmers who did not buy crop insurance. These findings indicate that fertilizers and pesticides appear to be production inputs that increase risk for farmers.

**Mishra** conducted a study in **1994** that analyzed the impact of a credit-linked Comprehensive Crop Insurance Scheme (CCIS) on crop loans for small farmers in Gujarat. The study revealed that CCIS had a collateral effect, meaning it led to an increase in the loan amount per borrower and a decrease in the percentage of small farmers who did not take out loans. Broadening credit access in this manner can have positive effects - enabling more inputs, higher output, and increased employment. Furthermore, boosting small farmers' portion of total loans can enhance fairness and efficiency.

**Bhende (2005)** discovered that the income of farm households in semi-arid tropical regions mainly involved in rain-fed agriculture was positively linked to the level of risk. Therefore, the existence of formal mechanisms for spreading risk, such as crop insurance, will enable farmers to adopt risky but profitable technologies and farming practices, leading to increased income.

It is observed that households with insurance invest more in agricultural inputs, leading to higher production and income per unit of land area. Notably, the percentage increase in output and revenue is greater for small farms. Per 1991 data, CCIS was found to contribute to a 23, 15, and 29 percent increase in the income of insured farmers in Gujarat, Orissa and Tamil Nadu, respectively (Mishra 1994).

## Objectives of the Study

1. To understand the performance of the existing and earlier agricultural insurance schemes implemented in India
2. To discuss the problems and prospects of agriculture insurance in the country

## Need for Agricultural Insurance in India

The agricultural sector in India was still heavily reliant on seasonal monsoon rains. The unpredictable and uneven distribution of monsoon rainfall led to volatility in crop yields and prices, exposing farmers to considerable risk and uncertainty. Given the high risks of rain-fed agriculture, allocating risk is a key aspect of decision-making for farmers. This highlights the need for contingency plans to better manage risky outcomes across individuals. Therefore, designing and implementing contingent contracts is integral to the development process in Indian agriculture.

Traditionally in India, risk would be managed privately or through implicit agreements within families or social networks like caste groups or joint families. Such arrangements can effectively handle risks that are not correlated across communities. However, yield risks are often locally correlated, so these traditional contracts within villages and families would not adequately insure against yield risks.

Another common risk coping strategy among farmers is income/crop diversification to reduce income variance. If the benefits of reduced risk exposure from crop diversification are substantial, farmers may diversify instead of specializing in their comparative advantage, despite forfeiting some potential gains from trade and specialization. While rational for the individual, this strategy undermines a nation's competitive advantage that comes through specialization, hindering national development. Labor productivity would likely increase with specialization. Agricultural research could also focus on fewer crops and become more effective at developing new technologies. Moreover, lower transportation and transaction costs from specialization would stimulate trade and increase gains from trade. Regional specialization also enables the development of specialized infrastructure.

By reducing the need for on-farm diversification, these contracts can promote crop specialization. Regional specialization in competitively advantageous crops/products increases farm efficiency and facilitates the implementation of research, development, and crop-specific government programs through scale economies. Specialization also enables off-farm and non-farm employment opportunities for much of the rural population. Hence, a development policy encompassing explicit insurance for farm and non-farm activities/workers aids economic development through specialization, while also stabilizing incomes for farmers and rural workers.



## AGRICULTURAL INSURANCE SCHEMES IN INDIA

Agricultural insurance gives farmers a useful method to decrease losses resulting from natural calamities such as floods, droughts, and infestations of pests and diseases. The government has implemented various initiatives meant to advance and protect the interests of the agricultural sector. These programs consist of plans that

### 1. First Individual Approach Scheme

Different forms of experiments on agricultural insurance on a limited, ad-hoc and scattered scale started from 1972-73 when the General Insurance Corporation (GIC) of India introduced a Crop Insurance Scheme on H-4 cotton. In the same year, general insurance business was nationalized and, General Insurance Corporation of India was set up by an Act of Parliament. The new corporation took over the experimental scheme in respect of H-4 cotton. This scheme was based on "Individual Approach" and later included groundnut, wheat and potato. The scheme was implemented in the states of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Tamil Nadu and West Bengal. It continued up to 1978-79 and covered only 3110 farmers for a premium of Rs.4.54 lakhs against claims of Rs.37.88 lakhs.

### 2. Pilot Crop Insurance Scheme (PCIS)

This Scheme was introduced in 1979 by the General Insurance Corporation. This scheme took an 'Area Approach' to provide insurance protection if crop yields fell below a minimum threshold level. The scheme initially covered cereals, millets, oilseeds, cotton, potato and chickpea, and was limited to farmers who had taken institutional loans. Participation was voluntary. From 1979 to 1984-85, the Pilot Crop Insurance Scheme operated in 12 states, insuring 6.23 lakh farmers for total premiums of Rs.195.01 lakhs against total claims of Rs.155.68 lakhs over the whole period.

### 3. Comprehensive Crop Insurance Scheme (CCIS)

The Comprehensive Crop Insurance Scheme (CCIS) was the first nationwide crop insurance program implemented in India when it was introduced in 1985. Prior to CCIS, crop insurance schemes in India were either small experimental pilots or limited projects carried out in a scattered manner. The CCIS linked payouts to short-term agricultural loans and used a 'homogenous area approach' to determine claims. The central government of India launched the CCIS during the 1985-86 season. By the 1999 Kharif season, 15 states and 2 union territories had adopted the program. Both the PCIS and CCIS were restricted to farmers who had obtained seasonal agricultural loans from financial institutions. The main difference was that the PCIS was voluntary while the CCIS was mandatory for farmers taking loans. The CCIS covered 763 lakh farmers for a premium of Rs.404 crore against claims totaling Rs.2303 crore. In 1999, the more inclusive National Agricultural Insurance Scheme was introduced with the goal of covering all farmers, regardless of whether they had loans.

#### 4. National Agricultural Insurance Scheme

India has a modified crop insurance program called the National Agricultural Insurance Scheme. This scheme has been implemented since the 1999-2000. The 2002-03 Union Budget proposed setting up an Agricultural Insurance Corporation (AIC) with capital participation from the General Insurance Corporation of India (GIC) and four public sector general insurance companies - National Insurance Co. Ltd., New India Assurance Co. Ltd., Oriental Insurance Co. Ltd. and United Insurance Co. Ltd. - as well as NABARD. The capital contribution to AIC's paid up capital will be: 35% from GIC, 30% from NABARD, and 8.75% each from the four public sector insurance companies. AIC's authorized capital will be Rs. 1500 crore, while the initial paid-up capital will be Rs. 200 crore. The National Agricultural Insurance Scheme (NAIS) will be transferred to AIC and will form the core business initially. The transition to an actuarial regime will happen gradually over time. Eventually, AIC will cover other allied rural/agricultural risks along with crop insurance.

**The objectives of the program are:** a) To provide insurance coverage and financial support to farmers in case of crop failure due to natural calamities, pests and diseases. b) To encourage farmers to adopt progressive farming practices, use high value inputs and improved technology.

**Key features:** a) Scheme is available to all farmers irrespective of land holding size. b) Covers all crops with reasonable past yield data. c) Compulsory for loanee farmers, optional for non-loanee farmers. d) Sum insured is capped at threshold yield for the crop in that area. e) Premium rates are: 3.5% for bajra and oilseeds, 2.5% for other kharif crops, 1.5% for wheat and 2% for other rabi crops.

#### 5. National Agricultural Insurance Scheme (NAIS)

The National Agricultural Insurance Scheme (NAIS) was launched in India during the 1999-2000 Rabi growing season with the goal of expanding insurance protection for farmers, crops, and exposure to risks. It replaced the previous Comprehensive Crop Insurance Scheme (CCIS). The main objective of NAIS was to safeguard farmers against crop losses resulting from natural disasters like drought, flood, hailstorm, cyclone, pests, and diseases. The scheme was implemented by the Agriculture Insurance Company of India Ltd. (AIC). NAIS was available to all cultivators, both those with and without loans, regardless of farm size. It provided coverage for all food crops (cereals, millets, pulses), oilseeds, and annual commercial/horticultural crops for which adequate historical yield data was available. NAIS continued until the 2013 Kharif season, although some states were allowed to continue implementing it in the 2013-14 Rabi season as well. Participation in the scheme was optional for states/union territories (UTs) and it was implemented in 25 states and 2 UTs for one or more seasons. From its launch until 2012-13, NAIS insured 208.48 million farmers for total premiums of 86,712.1 crore rupees and total claims of 253,755.8 crore rupees. The total insured area was 313.77 million hectares during this period.

## 6. Modified National Agricultural Insurance Scheme (MNAIS)

To make the Scheme more accessible and farmer-friendly, a proposal on the Modified National Agricultural Insurance Scheme (MNAIS) was prepared and approved by the Government of India to be implemented as a pilot program in 50 districts beginning in the 2010-11 Rabi season. Over the course of its execution in 17 States for five seasons, the MNAIS insured 45.80 lakh farmers for a premium of Rs. 1,08,800 lakh against a claim amount of Rs. 86,400 lakh through the 2012-13 Rabi season. The total area insured was 46.79 lakh hectares during this period.

## 7. Pilot Weather Based Crop Insurance Scheme (WBCIS)

In 2007, the Pilot Weather Based Crop Insurance Scheme (WBCIS) was introduced in 20 states with the goal of increasing crop insurance adoption among farmers. In addition to the Agriculture Insurance Company of India, private insurance companies were also permitted to implement the scheme. The purpose of WBCIS is to provide insurance protection to farmers against unfavorable weather events like insufficient or excessive rainfall, extreme temperatures, humidity etc. that can negatively impact crop yields. A key benefit is that claims can be settled very quickly under this scheme. Although WBCIS premiums are calculated actuarially, the premiums actually charged to farmers are capped at the same level as the NAIS scheme in order to make WBCIS more attractive. Between 2007-08 and 2012-13, WBCIS was implemented in 18 states covering 469.38 lakh farmers for total premiums of Rs. 7,51,920 lakh against claims of Rs. 52,860 lakh. The total insured area during this period was 632.01 lakh hectares.

## 8. Pilot Coconut Palm Insurance Scheme (CPIS)

The Coconut Palm Insurance Scheme (CPIS) was approved on a trial basis for 2009-10 and 2010-11 in selected areas of Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu and later West Bengal. The pilot was implemented in 2011-12 and 2012-13, and continued in 2013-14. Fifty percent of the premium is paid by the Government of India, 25 percent by the respective State Government, and the remaining 25 percent by the farmer. The Coconut Development Board (CDB) administers CPIS. Under the scheme, 51,108 farmers were covered for a premium of Rs.167.69 lakh against claims paid of Rs.214.05 lakh until December 2013. And the total area covered in the same period was 25,938 hectares.

## 9. National Crop Insurance Programme (NCIP)

To make Crop Insurance Schemes more beneficial for farmers, the government launched a new Central Sector Scheme called the 'National Crop Insurance Programme' (NCIP) starting in the 2013-14 Rabi season. The existing crop insurance schemes - Modified National Agricultural Insurance Scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) and Coconut Palm Insurance Scheme (CPIS) - were consolidated under NCIP with various enhancements for implementation across India. However, some states were allowed to continue the National Agricultural Insurance Scheme (NAIS) for Rabi 2013-14 at their request. Under NCIP, the goal is to expand the coverage to 50% of farmers and crop area insured by 2016-17, up from about 25% of farmers and 20% of area

covered previously. For coconut farmers, the target is to reach 25% coverage under CPIS by 2013-14, with a 5% increase each subsequent year of the 12th Five Year Plan.

### 10. Pradhan Mantri Fasal Bima Yojana (PMFBY)

The Pradhan Mantri Fasal Bima Yojana (PMFBY) crop insurance scheme was launched across India starting with the Kharif 2016 growing season. The Objectives of PMFBY are: a) Providing financial support to farmers impacted by crop damage/loss from unforeseen events such as natural disasters. b) Stabilizing farmer incomes to ensure their continued participation in agriculture. c) Guaranteeing credit flow to the agricultural sector for objectives like food security, crop diversification, growth, and protecting farmers from production risks and d) Promoting innovative, modern agricultural practices among farmers.

**Key points of the Scheme:** a) PMFBY is mandatory for farmers taking loans and optional for non-loanee farmers. b) The insurance unit is the village/village panchayat and c) Premium rates are 2% for Kharif, 1.5% for Rabi, and 5% for commercial/horticultural crops on the insured amount.

**Crops Covered:** a) Food crops - Paddy, wheat, black gram, green gram. b) Oilseeds - Rapeseed and mustard. c) Annual commercial/horticultural crops - Potato, sugarcane, jute.

**Coverage of the risk:** a) Prevented sowing/planting due to inadequate rainfall or adverse weather. b) Post-harvest losses up to two weeks after harvest, c) Standing crops damaged by drought, dry spells, floods, pests, diseases, landslides, fire, lightning, storms, hail, cyclones, typhoons, hurricanes and tornadoes, d) Localized disasters like hailstorms and landslides.

**Requirements:** a) States must conduct crop cutting experiments at notified insurance unit levels. b) Yield data submitted to insurance companies within time limits, c) Claims settlement based on yield data, d) States make budget provisions to release premium subsidies, e) Use of smartphones and mobile apps to quicken claims settlement.

In 2019, the Pradhan Mantri Fasal Bima Yojana (PMFBY) paid out over ₹96,242 crore in claim settlements compared to the farmer premium contribution of ₹17,524 crore. This payment was for the Rabi cropping season of 2019-2020.



### Some issues and challenges in crop insurance schemes

Crop insurance in India uses an area-based approach, where the area is the basic unit for calculating yield losses and payout rates. This works only when there is a strong link between individual farmers' yields and the yields from crop cutting trials. However, this condition is rarely met, resulting in fundamental risk - farmers suffering crop losses without receiving compensation. Furthermore, for farmers who do get payouts, the payment is significantly delayed in most cases. The loss sharing arrangement between central and state governments, along with operational procedures, are cited as major reasons for the delay.



Since the agricultural insurance market is far from ideal, insurance requires bundling with other offerings like credit, as implemented in India. Farmers taking out short-term agricultural loans are automatically and mandatorily required to insure their crops. But for farmers wanting to voluntarily purchase insurance, banks serve as financial intermediaries. Experience so far shows that banks have poor incentives to promote crop insurance, with only 4% of the premium paid to banks as a service fee, which is very low. This poor incentive, along with increased workload, makes banks ineffective promoters of voluntary crop insurance.

Insurance is a financial instrument to manage risk, not to increase income. It also involves complex terminology like sum insured and indemnity levels, whose understanding is vital for farmers to make informed decisions. Awareness creation and training programs play a key role in convincing farmers to take up insurance. Lack of adequate databases for determining premiums and payouts is another challenge faced by insurance providers and policy makers.

## Conclusion

Agriculture in India is often impacted by natural disasters such as droughts, floods, cyclones, storms, landslides and earthquakes. The susceptibility of farming to these events is intensified by outbreaks of disease and human-caused catastrophes like fires, sale of counterfeit seeds, fertilizers and pesticides, and price crashes. All of these occurrences severely affect farmers through loss of production and income, and are beyond their control. With the increasing commercialization of agriculture, the extent of loss from adverse events is rising. Agricultural insurance is one way farmers can stabilize farm income and investment and gain protection from disastrous effects of losses stemming from natural hazards or low market prices. Crop insurance not only stabilizes farm income, but also helps farmers resume production after a difficult agricultural year. It cushions the shock of crop losses by providing farmers with a minimum level of protection. It spreads crop losses over space and time and enables farmers to make more investments in agriculture. Insurance comes at the end of the risk management process. Insurance redistributes the cost of losses of a few among many, and cannot prevent economic loss.

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