REVIEW ARTICLE Bhartiya Krishi Anusandhan Patrika, Volume 38 Issue 1: 19-28 (March 2023)

Insights into Crop Insurance in the Agriculture Industry in India: An Overview

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10.18805/BKAP604

ABSTRACT

Agriculture is dangerous in India due to output and price instability. Crop insurance helps farmers by stabilizing agricultural profits, encouraging them to farm, lowering debt and reducing the need for crop failure assistance. This study examined crop insurance schemes in India and their effects on farmers. Based on terms like crop insurance, Insurance, Pradhan Mantri Fasal Bima Yojana we collected 175 papers by using various database such as Google Scholar, Web of Science and EBSCO host along with government data. Each manuscript's title determined its initial relevance. Crop insurance is an important risk management tool, but most Indian farmers can't afford it. The Indian government produces new agricultural policies every few years, but crop insurance programmes have been inconsistent and inefficient due to operational flaws. Agriculture insurance in India is still growing so that further research is need to be done to investigate the potential of an agriculture insurance market in India that is both financially sustainable and economically advantageous and successfully mitigates farmers' risks.

Key words: Agriculture insurance, Crop insurance, Pradhan Mantri Fasal Bima Yojana, Weather-index based crop insurance scheme.

According to the World Bank, rural areas are home to 46% population of the world and 70% of the poor population lives in rural areas only (Sovacool, 2018) with agricultural as their primary contributors to economic growth such as livelihood, income and employment (Ferdous *et al*., 2021). India is located in the low latitude region of South Asia, which is highly vulnerable to climate change because of its tropical climate, long coast line, high rate of poverty, monsoon, greater reliance on agriculture, poor irrigation coverage and insufficient resources and technology to prevent climate change (Aryal *et al*., 2020). Agriculture is India's most important and leading economic industry, it employs the majority of the agricultural population and act as a main contributor of the country's gross domestic product (Banerjee and Bhattacharya, 2011). The agricultural sector makes a significant contribution to the global economy. Compared to other economic sectors, agriculture has a much stronger impact on lowering poverty and enhancing food security (Irz *et al*., 2001) and provides a livelihood for 58 percent of the Indian population (Saha *et al*., 2021). Agriculture accounts for 14.4 per cent of total gross value added. In 2014-2015, agriculture's growth rate was 0.2%, jumped to 6.3 percent in 2016-2017 and then dropped to 2.9 per cent in 2018-2019. In India, in 2017-2018 just 26% of cropped land is insured (Tiwari *et al*., 2020). Agriculture is a risky profession due to production instability and market uncertainties, which also directly impact farmers' income levels (Kaur *et al*., 2021).

Every year, India suffers from severe weather, natural disasters, pests and diseases. In the last 20 years, there have been 7,000 natural disasters. 40% was in Asia (Cariappa *et al*., 2021). South Asia and South Africa have suffered higher climate-related losses than Europe and North America (Ranganathan *et al*., 2019). Extreme temperature and rainfall have lowered India's agricultural productivity by 4.35 and 9.75 per cent in the recent decade (GoI, 2018). More over half of India's cropped land is still rainfed, while small and marginal farmer's ratio is roughly 34% (Gulati *et al*., 2018). These disasters harm 12 million hectares of crops annually, lowering yields and agricultural productivity. Farmers are largely susceptible to yield and price risks. A third of rural farm households risk losing their harvests (Birthal *et al*., 2019). Unpredictable rainfall disrupts demand-supply balance, causing price volatility (Gulati *et al*., 2018). Minimum support prices (MSP) has been set for 23 commodities to cover price variations. The implementation seems to be concentrated on rice and wheat, failing to protect farmers in all states (Caraippa *et al*., 2021). Crop failure is mainly caused by weather (Odening and Shen, 2014),

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How to cite this article: Banita and Gurung, P. (2023). Insights into Crop Insurance in the Agriculture Industry in India: An Overview. Bhartiya Krishi Anusandhan Patrika. 38(1): 19-28. doi: 10.18805/BKAP604.

Submitted: 29-10-2022 **Accepted:** 03-04-2023 **Online:** 21-04-2023

hence crop insurance might reduce the risk. Farmers with crop insurance are protected financially from natural disasters (Senapati, 2020). Crop insurance takes up a large share of the worldwide agricultural insurance business, according to the World Bank. Crop insurance makes up 90% of premiums (Zhichkin *et al*., 2020). Agriculture insurance is vital for rural development, especially in drought-prone areas where it helps farmers manage weather risks (Singh and Agrawal, 2020).

Methodology

This study looked only for empirical English-language articles that matched the keywords "crop insurance" and "Pradhan Mantrin Fasal Bima Yojana", on well-known peer-reviewed journals' websites. Only studies recommending a technique for conducting a literature review were examined. We included government data to conduct this review studies. Each manuscript's preliminary relevancy was determined based on its title. We have collected more than 175 papers from various publishing agencies. We collected the entire citation, including the author, year, title and abstract, for further study. We searched Google Scholar, Web of Science and EBSCO host, three frequently employed databases. As a result of various approaches archived and retrieval practices are evolving. The literature review method requires us to examine the abstracts of 80-90 studies to identify their applicability to the research problem.

Crop insurance

In insurance, losses suffered by few are covered by small payments paid by many who are exposed to similar risk (Hartwig *et al*., 2020). Crop insurance protects farmers against financial loss due to crop failure caused by natural calamities beyond their control, such as fires, pests, diseases, weather, floods, *etc* (Raju and Chand, 2008). The sum insured could be the total spending, a multiple, or a percentage of predicted crop earnings (Ghosh *et al*., 2021). Indemnification is based on the difference between the guaranteed and average yields (threshold yield). The claims are allowed when the yield loss is verified. This risk management approach in agriculture has been emerged in India since over the century, from idea to execution and it continues to evolve in terms of scope, practices and methodology. Crop production in India is strongly dependant on the weather, which is affected by its vagaries as well as pests and disease. Crop insurance ensures long-term sector stability (www.aicofindia.com). Crop insurance "protects farmers from crop yield uncertainty arising from practically all natural events, which are unforeseen and uncontrollable, making Indian agriculture a high-risk occupation and is a financial instrument that minimizes the chance of crop yield loss by combining a great number of uncertainties that affect crop yields so that the loss burden could be divided (Rao, 2002).

In spite of the fact that about 58% of India's population relies on agriculture as their main source of income (IBEF, 2022), the agricultural catastrophe, particularly crop failures, is the major cause of farm suicides there, followed by various natural disasters such as droughts, storms and floods (Blog and Concern, 2021). Crop insurance is essential for developing nations like India because it provides benefits to insured in the form of income stability, debt reduction and exposure to new farming techniques like the Internet of Things (IoTs) and Block chain, which may safeguard farmers from agricultural losses (Jha *et al*., 2021). In India, a proposal for crop insurance was made a searly as 1920. Following independence, both the state and central go vernments tried again to implement crop insurance plans for Indian farmers (Kumar *et al*., 2021). Minister of Food and Agriculture Dr. Rajendra Prasad discussed the issue in 1947 and assured that the government will look into the potential of combining crops and livestock insurance. Two crop insurance pilot programs were launched in 1950, however due to resource constraints; the state did not adopt these schemes. After a prolonged absence, later attention was given to the crop insurance during the third five-year plan era (1961-1966). A model crop insurance program was designed by the Indian government in 1965 and distributed to state governments (Nirmal and Babu, 2021). However, because the state was required to pay for a share of the premium subsidies, none of the state supported the programmes (Dandekar, 1976).

In March 1970, a committee under Dr. Dharam Narayan drafted a crop insurance bill. On this model, LIC started crop insurance in 1972. Coverage was limited for independent India's first crop insurance trial. Individual Plan with a $454k premium and $3.788 m in claims. The individual method was ended because to a 1:8.34 premium claim ratio (Rao, 2019). General Insurance Corporation's Pilot Crop Insurance Plan (GIC) and a new crop insurance scheme replaced it in 1978. In 1979 the introduction of the Pilot Crop Insurance Schemes (PCIS) (Nirmal and Babu, 2021). Comprehensive Crop Insurance Programme was the first countrywide crop insurance scheme (Kumar *et al*., 2021). This scheme was seized in 1997 (Mohammed, 2021). In 1999, it was replaced by the National Agriculture Insurance Scheme, afterwards renamed Modified National Agriculture Insurance Scheme. In later years, the Indian government created various trial crop insurance plans, including the Pilot Scheme on Crop Insurance (2000), the Farm Insurance Scheme (2003) and the Weather-Based Crop Insurance Scheme (2007). Insurance schemes have undergone several modifications to improve premium prices, claims and other difficulties (Gulati *et al*., 2018). Developing and implementing a successful agriculture insurance coverage takes time. Analysis of Crop Insurance Schemes in India after Independence is given in the Table 1.

Brief review of crop insurance in India

Panda (2013) evaluated the significance of crop insurance for social protection of farmers in the context of climate change. Gaurav (2015) investigated insured agriculture households in the Vidharbha province of Maharashtra's rain-fed regions and discovered that smallholder households

have limited access to insurance as compared to wealthy farmers. According to Manoj *et al*., (2017), the PMFBY scheme is limited to the state of Haryana. According to (Ward and Makhija, 2018), farmers in Odisha state are less interested in crop insurance, which performed an empirical exploration of drought risk management for them. Jain and Dharmaraja (2019) suggested a mathematical methodology for improving crop insurance penetration and risk coverage. Bhoi and Dadhich, (2019) proposed a composite insurance plan concept to mitigate the risk of market distortion and crop failure. According to Ghosh *et al*., (2019), farmers are more willing to pay a premium for a faster claim settlement. Mukherjee and Pal (2019) suggested that enhancing agricultural extension services may indeed be important for increasing crop insurance awareness and as a result, its coverage in India. Ghosh *et al*., (2021) evaluated that farmers doesn't really have a strong preference for the mechanism by which losses are calculated, but they value the assurances that they'll get timely compensation when they experience losses as they are quite sensitive in case of coverage period. Dupdal *et al*., (2020) concluded that the government's effort to extend the scheme across the country, participation among farmers was poor and undesirable.

Current status of agriculture insurance in India

Currently two crop insurance schemes are operational: the Pradhan Mantri Fasal Bima Yojana (2016) and the Restricted Weather-Based Crop Insurance Scheme (Kaur *et al*., 2021; Vishnoi *et al*., 2020). With the help of these insurance schemes climate-related crop risks in agriculture production are insured (Singh *et al*., 2018). State g overnments have full authority to select among PMFBY and RWBCIS, or both.

Pradhan Mantri Fasal Bima Yojana

The PMFBY was designed to overcome the flaws in all prior schemes. PMFBY scheme was launched on February 18, 2016 in every state of India which replaced the previous MNAIS scheme, with the collaboration of respective state governments (Singh and Agrawal, 2020). The PMFBY scheme is applicable on all smallholder and tenant farmers in the notified areas who grow pre-notified crops such as pulses, cereals, oilseeds and other horticultural crops. PMFBY's main objective is to assist farmers with insurance protection and financial support in the event of crop loss (Bhushan and Kumar, 2017). PMFBY offers more farmer-friendly policies than the preceding NAIS and MNAIS programmes. PMFBY has promoted the adoption of modern technologies for accurately evaluate losses and make payments to farmers quickly. However, farmer income is crucial determinant of PMFBY access (Mukhopadhyay *et al*., 2019). The primary implementation of PMFBY was unproductive and unsuccessful in terms of crop losses and claims reimbursements into farmers' accounts (Gulati *et al*., 2018). But because of the unique characteristic of compulsory insurance coverage for loanee farmers, PMFBY is able to encourage small scale farmers to adopt the scheme. West Bengal, Gujarat, Maharashtra, Madhya Pradesh, Karnataka, Haryana and Uttar Pradesh have witnessed significant increases in insurance coverage (Singh and Agrawal, 2020). The main amendments the government has made thus far are listed in Table 2.

Weather-Index Based Crop Insurance Scheme (WBCIS)

For weather risks WBCIS is a substantial solution and performs as disaster insurance in agriculture in the event of adverse weather events (Bjerge and Trifkovic, 2018). WBCIS emerged as an alternative option for farmers because it addresses the shortcomings of traditional agricultural insurance by insuring weather risk in agriculture (Nair, 2010). WBCIS had first been introduced in India in 2003 as a pilot project in the state of Andhra Pradesh, with support of the World Bank and in association with Basix (a microfinance conglomerate) and ICICI Lombard general investment company (Singh and Agrawal, 2020). It was adopted on a wide scale in approximately 19 states in 2011-2012 and it covered all types of crops. In WBCIS' preliminary trials, which lasted from 2003 to 2006, revealed that it was extremely vulnerable to basis risk due to somewhat high premiums. In 2006-2007, the coverage area of WBCIS was significantly reduced because of the difficulty in persuading farmers for the WBCIS' efficiency. Due to the premium rebate, the scope under WBCIS has grown at a remarkable rate, from a total premium collection of rupees in 2006-2007 of 70 million to rupees 18 billion in 2011-2012, showing an almost 250-fold increase in just five years (Singh, 2013). WBCIS insured around 47 million farmers from 2007-2008 to 2012-2013. WBCIS has been successful in India because it is linked to farmers' credit and is obligatory and forcibly coupled with agriculture loans and farmers must acquire credit to obtain crop insurance under WBCIS (Raju *et al*., 2016). On the other hand, non-loanee farmers are also eligible to obtain the WBCIS. In 2016, it was reformed as RWBCIS, with premium rates similar to PMFBY. Earlier, RWBCIS was charged actuarial premium rates, which were altered in 2016 to set premium rates at par with PMFBY (Nair, 2010).

Need of crop insurance

In developing nations, well-functioning insurance policies are required to assist farmers in coping with weather-related disruptions and to safeguard poor farmers against agricultural and economic risks and become a priority and help farmers lower their risk load (Raju and Chand, 2008). Crop insurance expands crop losses over temporal and spatial, provide the social security to farmers, offer self help, facilitates in sustaining their dignity, encourages massive investments in agriculture in order to improving yield and increasing agricultural output (Singh, 2004). 70 per cent of agricultural productivity in India is vulnerable to monsoon fluctuations. Weather shocks account for 60% of the variance in yield (Tiwari *et al*., 2020). India is on the verge of being the world's suicide capital for farmers (Joy, 2019). It is estimated that 75,000 suicides were committed in the period of 2016-2020 and 400,000 in the twenty-five years since 1995, according to P.C. Bodh, Indian Economic

Table 1: Chronological analysis of crop insurance schemes in India after independence.

Insurance Scheme	Period	Implementing agency	Approach	Crops covered	Farmers insured	Gross premiums (Rs.)	Claim paid (Rs.)	Salient features
Individual Indemnity -based Crop Insurance Scheme	1972-1978	Government Insurance Company (GIC)	Individual	Wheat, potato, groundnut, H-4 cotton	3110	4.54 lakh	37.78 lakh	The insurance plan was only deployed in six states and participation was entirely voluntary.
Pilot Crop Insurance Scheme	1979-1984	Government Insurance Company (GIC)	Homogeneous area	Cereals, gram, oilseeds, cotton, millets, potato	6.22 lakh	195.01 lakh	155.68 lakh	Participation was optional and related to agricultural loans; premium rates offered ranged from 5% to 10% and risk was split in the ratio of 2:1 between the national and state governments.
Comprehensive Crop Insurance Scheme	1985-1999	Government Insurance Company (GIC)	Homogeneous area	Rice, millets, Oilseeds, pulses and wheat	763 lakh	402.81 lakh	2305.04 lakh	It was compulsory for all the loanee farmers to participate and state of Gujarat received the greatest claims.
National Agriculture Insurance Scheme	1999-2016	GIC, Agriculture Insurance Company of India from 2003	Homogenous area and individual-based	Cereals, pulses, oilseeds and horticulture crops	2712.2 lakh	467504.76 crore	56,453.77 crore	Covered all farmers; enrollment was obligatory for loanee farmers and elective for non-loanee farmers; 25 states and two union territories implemented this; rates of premium ranged from 1% to 4%.
Weather-based Crop Insurance Scheme	2007-2016	Agriculture Insurance Company of India	Homogeneous area	Commercial crops, food crops and oilseeds and	720.2 lakh	12,161.4 crore	9665.47 crore	Enrollment was mandatory for loanee farmers and optional for non-loanee farmers; 21 states and union territories executed the scheme; private insurance firms also offered coverage; The states of Rajasthan and Bihar profited enormously, wiith high premium rates.
Modified National Agriculture Insurance Scheme	2010-2016	Agriculture Insurance Company of India	Homogeneous area	Millets, cereals, pulses, oilseeds, Annual horticulture and commercial crops	276.62 lakh	4935.77 crore	5578.42 crore	Participation was mandatory for loanee farmers and optional for non-loanee farmers; national and state governments offered 75 per cent subsidy to all farmers on a 50:50 basis; including both public and private companies participation.

Table 1: Continue...

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Restructured Weather -based Crop Insurance Scheme	2016 onwards	Public private partnership	Weather based area	All food grains crops, oilseeds, annual horticulture and commercial crops	62.48 lakh (2016-2018)	6886.56 crore (2016-2018)	6186.32 crore (2016-18)	Participation is mandatory for loanee farmers and optional for non-loanee farmers; risks are covered from pre -sowing to post-harvest; premium rates are low or similar to those offered under the Pradhan Mantri Fasal Bima Yojana.
Pradhan Mantri Fasal Bima Yojana	2016 onwards	Public private partnership	Homogeneous area	All food grains crops, oilseeds, annual horticulture and commercial crops	1617.31 lakh (2016-2018)	606.534.7 crore (2016-2018)	52.413 crore (2016-2018)	Covered all farmers; initially participation was mandatory for loanee farmers, but it was made Optional for loanee farmers from *kharif* 2020; use of advanced technologies for claims assessment; low premium rates; covered risks from pre-sowing to post-harvest; one season, one premium; executed by 27 states/union territories between 2016 and 2017 respectively.

Source(s): Extracted from Agriculture Insurance Company of India Limited, New Delhi and compiled by authors.

Service Officer. In 2020, the total number of farmers who committed suicide fell to 5,579, down from 5,957 the previous year. According to NCRB (National Crime Records Bureau) statistics presented to the Lower House, Maharashtra reported 2,567 farmer suicides in 2020, preceded by Karnataka with 1,072 incidents Andhra Pradesh with 564, Telangana with 466, Madhya Pradesh with 235 and Chhattisgarh with 227. Crop insurance may safeguard farmers against yield and market price uncertainty as a risk management tool (Van Asseldonk *et al*., 2019). Agriculture, being a highly unsafe economic industry due to its dependency on weather conditions, cannot be overstated in terms of a need for insurance (Pandey, 2015).

Coverage of crop insurance in India

Crop insurance coverage in India is quite limited (Aditya *et al*., 2018). Crop insurance policies have long existed in India, but they have failed to cover the majority of the agricultural sector (Rajeev and Nagendran, 2019a). Traditional indemnity-based insurance programs face plenty of well-documented issues, such as knowledge asymmetry in the form of adverse selection and moral hazards (Wu *et al*., 2019) and ambiguity aversion (Elabed and Carter, 2015). Farmers' poor understanding and lack of awareness regarding crop insurance's process results in decreased participation, unfavorable selection and dissatisfaction among those who do join (GoI, 2014). According to a CAG study done from 2011 to 2016, two-thirds of farmers were unaware of crop insurance (Rao, 2019). Even after the debut of Pradhan Mantri Fasal Bima Yojana, 66 per cent of the total of farmers are unaware of crop insurance (Rajeev and Nagendran, 2019b). Crop insurance has a low penetration rate due to a lack of information and awareness among farmers. Tenant farmers are still not covered by crop insurance even when the tenant farmers account for 40 per cent of total farmers (Rohini, 2020).

Adoption of crop insurance

The scheduled commercial bank or cooperative bank serves as a mediator for farmers who seek to willingly insured their crop because just 4% of the premium is given to the banks as a service charge and they get no incentive to bring additional farmers underneath the voluntary insurance umbrella (Swain, 2014). Farmers were found to be more interested to get crop insurance if they had a larger land holding and received a premium subsidy (Aditya *et al*., 2018). It is understood that a lack of awareness is the primary cause of non-adoption of an insurance system. Approximately 70% of farmers opted not to insured their crops for three reasons: insufficient knowledge, lack of awareness of the existence of facilities and lack of necessity (Aditya *et al*., 2018). Why is there such ambivalence regarding crop insurance, one could wonder? Firstly, the market will not offer adequate insurance on its own since the preconditions for perfect competition in the crop insurance industry no longer exist (Ahsan *et al*., 1982). Second, as a financial middleman, banks have little or have really no incentive to promote or sell insurance products. Third, due to insufficient triggers and a

Table 2: Major amendments made under PMFBY from 2016-2017 to 2020-2021.

Features	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Portal	No crop insurance portal is available.	The www.agriinsurance.gov.in portal was launched.	The www.pmfby.gov.in portal was launched in 2018.	-	-
Participation	Compulsory for loanee and voluntary for non-loanee farmers.	Compulsory for loanee and voluntary for non-loanee farmers.	Compulsory for loanee farmers and voluntary for non-loanee farmers.	Compulsory for loanee farmers and voluntary for non-loanee farmers.	From 2020 onwards, voluntary for all farmers.
Requirement of Aadhaar Card	Aadhaar card is optional for enrollment.	From 2017 onwards, Aadhaar card is mandatory for enrolment.	-	-	-
Business allocation	One year allocation to insurance companies.	One year allocation to insurance companies.	One year allocation to insurance companies.	One year allocation to insurance companies.	From 2020 onwards, three-year allocation to insurance companies.
Premium subsidy	Premium subsidies are equally shared by central and state governments.	Premium subsidies are equally shared by central and state governments.	Premium subsidies are equally shared by central and state governments.	Premium subsidies are equally shared by central and state governments.	From 2020 onwards, central Subsidy rates to be limited, *i.e.*, 30 per cent for unirrigated area and 25 per cent for the irrigated area and premium subsidy rates increased to 90 per cent for the northeastern states.
Cut-off dates	No cut-off date is fixed for states to release states' subsidy share	No cut-off date is fixed for states to release states' subsidy share	No cut-off date is fixed for states to release states subsidy share	No cut-off date is fixed 'for states to release states' subsidy share.	In 2020 onwards, for state participation, the cut-off dates are fixed, *i.e.*, March 31 and September 30, for the *kharif* and *rabi* seasons, respectively. If states do not release their premium shares before the given dates, they will not be allowed to participate in the scheme.
Provision for spending on information, education, *etc*.	Nothing specified	Nothing specified	Nothing specified	Nothing specified	From 2020 onwards, it is mandatory for insurance companies to spend 0.5 per cent of total premium on information, education, *etc*.
Yield estimation process	Yield estimation process is adopted three or more times	Yield estimation process is adopted three or more times	Yield estimation process is adopted three or more times	Yield estimation process is adopted three or more times.	From 2020 onwards, a two-step yield estimation process has been adopted by the previous yield estimation process.
Coverage of crop loss due to wild animals	Nothing specified	Nothing specified	Covered	Covered	Covered

Table 2: Continue...

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Risk coverage for states	States have to compulsorily cover all risks mentioned under the scheme.	States have to mandatorily cover all risks mentioned under the scheme	States have to mandatorily cover all risks mentioned under the scheme	States have to mandatorily cover all risks mentioned under the scheme.	From 2020 onwards, more flexibility has been given to states/UTs to decide on the number of additional risk coverage, such as prevented sowing, midseason, or post-harvest losses, *etc.*

Source: Government of India, PMFBY (Government of India 2016, 2018, 2020) and www.pmfby.gov.in (accessed on 05, July, 2022).

limited sum insured, the level of basis risk is high (Aditya *et al.*, 2018). In terms of adoption of crop insurance, the majority of the farmers have adopted the insurance at high level, whereas just one-third of them adopt this in low level (Sadati *et al.*, 2010).

Constraints in adoption of crop insurance

India's agriculture insurance has the world's biggest program through 25 million insured farmers (Bhushan *et al.*, 2016). Simultaneously, India has the world's greatest number of uninsured farmers. Nearly about 95 million farmers are uninsured because of problems in insurance design and interruptions in claim payment (Mahul *et al.*, 2012). According to a study by (Haque and Khan, 2017) found that farmers with small landholdings, insufficient irrigation facilities, financing, assets, or expert guidance are riskier and suffer great losses. Drought, disease/insect/animal attack emerged as a credible threat and a main cause of crop loss. Late payment of compensation is also issue of concern. The claim settlement procedure often takes a long time (from 6 to 12 months in certain cases), enabling all of the negative consequences of the crop losses to occur before the insured receives compensated. Theoretically, crop insurance seems to be an effective risk transfer mechanism, but in practice it is a more expensive method for the government to shift agricultural risk from producer farmers to insurers and the government Jain and (Dharmaraja, 2019). Agriculture insurance is ineffective for individual farmers who have experienced specific crop losses that do not affect the entire region. Farmer's faith in agricultural insurance is lost due to ineffective claim calculating process (Panda, 2017) and farmer's willingness to enroll in agriculture insurance is reduced (Rajeev and Nagendran, 2019b). Until 2011, just 10% of India's farmers were covered by the agriculture insurance policy, from the whole agrarian community (Deshpande, 2017). The majority of the farmers are dissatisfied with the insurance claim payout procedure. Another reason why most agriculture insurance schemes in India aren't being used is because of their unattractive design (Rajeev *et al.*, 2016).

CONCLUSION

Agriculture is a major contributor to any country's economic prosperity and employs a large number of people. Most nations are directly or indirectly dependent on agriculture. Governments introduce crop insurance plans, but the main question is whether or not the farmers benefited from these. Farmers need an affordable crop insurance scheme to strengthen their resistance to the impacts of climate change. Crop insurance participation is affected by expected yield, credit, farm revenue, land holdings, loss experience and land tenure. The system's complexity as well as delay in claim settlement are some shortcomings of the crop insurance and is the one of the main reasons why farmers are opposed to the programme. However, agricultural insurance has been implemented in India since 1972, but agricultural insurance is only available to a small proportion

of farmers because this sector was unable to provide enough protection to farmers as every insurance plan has been inconsistent, inefficient and had some operational flaws. On the basis of the discussion, this could be concluded that more research is required to explore the potential of economically beneficial and financially viable agriculture insurance in the Indian environment that successfully and effectively indemnifies farmers' risks and private firms must be invited to provide service to the farming community.

Research gaps and scope for future study

On the basis of missing issues in the published literature on agriculture insurance in India, several research gaps have been identified. These research gaps provide us with a basic framework for further research. There is need for study into varied pricing of insurance premiums in order to make them more economical for farmers. Further research needs to be done to develop more specific agriculture insurance for all categories of farmers, including loanees, non-loanees, smallholder farmers and wealthier farmers, in order to achieve the scalability which is require. The Pradhan Mantri Fasal Bima Yojna (PMFBY) was an initially successful initiative, however at present it is inefficient due to implementation issues. There is need for more research to look into the matter that how to improve the effectiveness of PMFBY.

Conflict of interest: None.

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