A STUDY ON THE PERFORMANCE OF PRADHAN MANTRI FASAL BIMA YOJANA (PMFBY) CROP INSURANCE IN INDIA

Abstract

This study examined the performance of Pradhan Mantri Fasal Bima Yojana (PMFBY) crop insurance scheme in India. To evaluate the performance of the Pradhan Mantri Fasal Bima Yojana, data on area insured, gross premium paid, number of farmers benefitted and number of claims paid during 2016-2021 were analyzed using descriptive statistics and compound annual growth rates. The effects of insurance characteristics on farmers' coverage under Pradhan Mantri Fasal Bima Yojana were estimated through multiple regression analysis by using cumulative data. Overall, from the comparison of all the crop insurance schemes that were functioning in India, PMFBY had a higher number of farmers and an enormous amount of land that was protected compared to other crop insurance schemes. Through the multiple regression model, the effects of the characteristics of the PMFBY on the farmers' coverage were studied, showing that the farmers' premium had a significant effect on the number of farmers insured over the time period. This paper also gives an overall knowledge and facts about various crop insurance schemes performing in India since the implementation of crop insurance as a tool for mitigating agricultural risk.

Keywords: India; the Pradhan Mantri Fasal Bima Yojana; crop insurance; food security; financing schemes

Introduction

Agriculture is the key source of livelihood for about fifty-eight per cent of the total Indian population. It had remained the silver lining of the Indian economy when all the other sectors were hit hardest during the pandemic. Though the agriculture sector is resilient to pandemic shocks, it is vulnerable to many other production, marketing, and price risk factors. One primary mechanism to cope with farm risk is by availing of crop insurance. There are many studies conducted to explain the need for agricultural insurance policies. Some of them were Halcrow (1949), Wu (1999), Enjolras and Sentis (2009), Chang and Mishra (2012), Wang ke et al. (2015), Bokusheva et al. (2016), Zhao and Yue (2018), (Mukesh and Kamal

Pandey (2019), Fahad and Zing (2017), Jorgensen et al. (2020) and Luckstead and Devadoss (2019). The findings from these studies are as follows:

After independence, crop insurance focused on eliminating farmers' yield variations and income fluctuations (Halcrow, 1949). This reduction in production risk by availing of crop insurance encourages small farmers to take up high-value and risky crops (Wu, 1999). It is necessary to consider that post-independence also brought in the concept of marginalization due to the division of lands by several land reforms, which increased the number of smaller farms in the country. These farms are naturally less diversified. Hence the need for crop insurance is a necessity for them (Enjolras and Sentis, 2009). Over time, crop insurance became a primary necessity for covering the cost of cultivation. Crop insurance availing was found to have a positive effect on fertilizer and chemical expenses (Chang and Mishra, 2012). This aspect of insurance aid is necessary as in countries like China, where crop insurance programs increased the welfare of the farmers by covering the physical cost of cultivation (Wang ke et al. 2015). Crop insurance has also shown substantial risk reduction in farms (Bokusheva et al. 2016). Some producers even consider agricultural insurance as a trade-off between potential indemnity and producer-paid premium. Such attitude of producers has made them risk-tolerant and stabilized their future revenue (Zhao and Yue, 2018). Most recent studies have shown that the primary concern of farmers has shifted to addressing the poor physical conditions of the land, weather fluctuations, and investments.

Over one-fourth of cultivating farms experience crop loss due to inadequate rainfall and drought (Mukesh and Kamal Pandey, 2019). Hence, Farmers take crop insurance as a mechanism for risk reduction to cushion them against the adverse effects of extreme weather conditions (Fahad and Zing, 2017). Unlike weather fluctuations, Soil quality is also an important factor in recent days that need to be addressed. Because Farms with Low soil quality are more risk-prone, which makes soil quality one of the factors for the need for crop insurance (Jorgensen et al. 2020). Apart from these, Insurance also acts as an investment tool to aid farmers in increasing crop acreage, and influences crop coverage decisions by nearly 70 per cent (Luckstead and Devadoss, 2019).

The objective of the study

This study attempts to

(1) review the various crop insurance schemes of India prior to PMFBY and understand the problems associated with them
(2) to assess the crop insurance schemes of India
(3) evaluate the performance of the Pradhan Mantri Fasal Bima Yojana (PMFBY) scheme since its implementation.

Evolution and fall of various agricultural schemes in India:

Crop insurance is one of the effective tools in developing countries that are used to smoothen farm income fluctuations along with minimum support prices, input subsidies, low-interest crop loans, and other mechanisms (Stutley, 2010). It protects the farmers against natural calamities and cushions the shock of crop loss. The underlying principle of crop insurance is that the loss incurred by a few is shared among others in an area engaged in a similar activity. Similarly, losses incurred in bad years are compensated by resources accumulated in good years (Dandekar, 1976). Henceforth, Initially the Government of India introduced a Comprehensive Crop Insurance Scheme in 1985 and later improved it into National Agricultural Insurance Scheme in 1999-2000 (Bhende, 2005).

National Agricultural Insurance Scheme was launched by the National Agricultural Insurance Scheme Corporation of India. NAIS followed the "area approach", where the homogeneous areas are defined as insurance units (district/taluka/block/Mandal/circle/gram panchayat/village, etc.). All the insured farmers in the specified area get the same indemnity (when the season's average yield per hectare of the insured crop for the defined insurance unit falls below the guaranteed yield) per unit of the sum insured. Though this scheme has benefitted small and marginal farmers to a great extent, the penetration level of the scheme seems to be poor as only one-fifth of the farmers were insured even after more than two decades of implementation. This might be due to late indemnity payments. Also, the coverage and indemnity were partial towards a few regions and crops (Nair, 2010).

Furthermore, the Area approach itself revealed several problems. The entire block was treated as a similar area for crop-cutting experiments, and the threshold yield was the normal yield which seldom indicated the proper yield levels of the areas affected by adverse climatic conditions (Santhi, 1991). These limitations under the area approach led to the development of a better crop insurance scheme that is "weather-based".

Weather-based insurance in India was first introduced in 2003 by ICICI Lombard for groundnut and castor farmers of Mahboobnagar district in Andhra Pradesh, followed by the pilot rainfall insurance scheme by IFFCO-Tokio General Insurance (ITGI) in 2004-05 in Andhra Pradesh, Karnataka, and Gujarat. Weather Index-based insurance is less susceptible to the problems that were intrinsic in traditional multi-peril crop insurance and benefits both the insured and the insurer. The most important advantage for the insurers over the traditional scheme is the prospect of receiving timely indemnity pay-outs given that the pay-outs for indexed contracts are automatically triggered once the weather parameter reaches the pre-specified level (Report of Joint group, GOI, 2004). WBCIS uses rainfall as an index which is easier to measure objectively and, hence, the data collection process is more transparent and less time-consuming. Besides these Low administrative costs facilitate quicker indemnity payments to the insured. Furthermore, WBCIS eliminates the problems of moral hazard and adverse selection (Hess, 2003).

The critical disadvantage of WBCIS is that it covers only weather-related risks. Hence, the insured farmer will not get any compensation if the crop loss is due to any other reasons like disease incidence or pest attacks. Furthermore, there was variability observed between the calculated loss value and the actual loss value experienced on the farm (Collier et al., 2009).

Currently, two insurance schemes are functional, i.e., Pradhan Mantri Fasal Bima Yojana (PMFBY) and Restructured Weather Based Crop Insurance Scheme (RWBCIS. PMFBY provides insurance coverage and financial support to the farmers in the event of failure of any of the notified crops as a result of natural calamities, pests & diseases. In contrast, the RWBCIS aims to mitigate the hardship of the insured farmers against the likelihood of financial loss on account of crop loss resulting from adverse weather conditions using weather parameters as "proxy for crop yields in compensating the cultivators for deemed crop losses (ICFA, 2016, Ministry of Agriculture and Farmers Welfare). Restructured weather-based crop insurance scheme (RWBCIS) has been introduced with the goal of providing coverage for those crops for which there is no fixed methodology for yield assessment. The scheme was revised based on the PMFBY's premium structure. PMFBY was designed to cover the loopholes of all the previous schemes and uses the technological advancement of recent days.

PMFBY - An Overview:

The PMFBY scheme operates on an area-based approach, and the lowest level of the notified area is called the Insurance Unit (IU), which is calculated on the basis of CCEs. If the actual yield per hectare of the insured crop for the insurance unit in the insured season falls short of the specified threshold yield, all insured farmers growing that crop in the defined area is deemed to have suffered a shortfall of similar magnitude in yield (ICFA, 2016, Ministry of Agriculture and Farmers Welfare). The PMFBY takes care of systemic or covariate risks linked with the weather as well as idiosyncratic losses. None of the previous insurance schemes have offered such comprehensive protection against crop risks as the litmus test of any insurance scheme lies in the quick valuation of crop damages and direct payment of claims to farmers (Ghosh 2019; Gulati et al. 2018).

Since the scheme's introduction, new elements have been added to the Pradhan Mantri Fasal Bima Yojana (PMFBY) by the Indian government from time to time. In 2016, an initial amount of Rs. 5,500 crores got sanctioned for the program in the union budget for the financial year 2016–2017 (Rai, 2019). This program offers an all-encompassing risk management solution at India's most affordable uniform premium cost. Other crop insurance plans, such as the National Agriculture Insurance Scheme and the Modified National Agriculture Insurance Scheme, which had certain inherent flaws, have been superseded by this scheme. Since this insurance program has a geographically focused methodology, it is available to all types of farmers, including those who get loans, those who do not receive loans, tenants, and sharecroppers. Initially, participation in the program was obligatory for farmers who had obtained a loan from a financial institution, but it was voluntary for farmers who had not obtained a loan. However, beginning in Kharif 2020, it was a voluntary requirement for loanee farmers. (GOI, 2020).

Further down the complete direction of the Ministry of Agriculture and Farmers' Welfare, several public and private insurance companies are responsible for putting the program into action. The phrase "one premium, one season" is the program's primary distinguishing characteristic. The program includes the Kharif and rabi growing seasons and yearly horticultural and commercial crops. The total premium that farmers are required to pay has been standardized at a rate of 5.0 per cent for annual horticulture and commercial crops, 2.0 per cent for Kharif crops, and 1.50 per cent for Rabi crops. The remainder of the premium is split evenly between the central government and each state's government.

After the program was implemented, the Indian government made several efforts to increase the number of beneficiaries and the amount of farmland it covered. As a part of awareness, the government of India has launched several websites like www.agriinsurance.gov.in and www.pmfby.gov.in in 2017 and 2018, respectively. In order to participate in this program, having an Aadhar card is now required as of 2017–2018. In the 2018–2019 fiscal year, the scheme compensated farmers for wild animals' agricultural losses also. Government of India has granted three years of business allocation instead of just one for insurance companies since 2021. From 2020 onwards, insurance companies must spend 0.5 per cent of the total premium on information and education. From 2016–2017 to 2019–2020, premium subsidies have been limited (30 per cent for unirrigated areas and 25 per cent for irrigated areas), and subsidies for the northeast have gone from 50 per cent to 90 per cent.

Since the inception of PMFBY, yield estimation has been adapted three or more times, and a two-step yield estimation process has been adopted since 2020. Until 2020, states have to cover all risks mentioned under the scheme. However, later flexibility has been given to states/ UTs to decide the number of additional risk coverage, such as prevented sowing, midseason, or post-harvest losses.

Materials and Methods

To evaluate the performance of the Pradhan Mantri Fasal Bima Yojana, data on area insured, gross premium paid, number of farmers benefitted and number of claims paid during 2016-2021 were analyzed using descriptive statistics and compound annual growth rates. A multiple linear regression was done to estimate the effects of insurance characteristics on farmer coverage for the same time period.

The effects of insurance characteristics on farmers' coverage under Pradhan Mantri Fasal Bima Yojana were estimated through multiple regression analysis by using cumulative data for 2016–2017 and 2020–2021 as:

Farmer's coverage (insured) under PMFBY =

$$\propto + \beta_1 \text{Gross Premium}_{t,i} + \beta_2 Farmers\ Benefitted_{t,i} + \beta_3\ Area\ Insured_{t,i} + U$$

Where u is the error term, and i refers to the states of India.

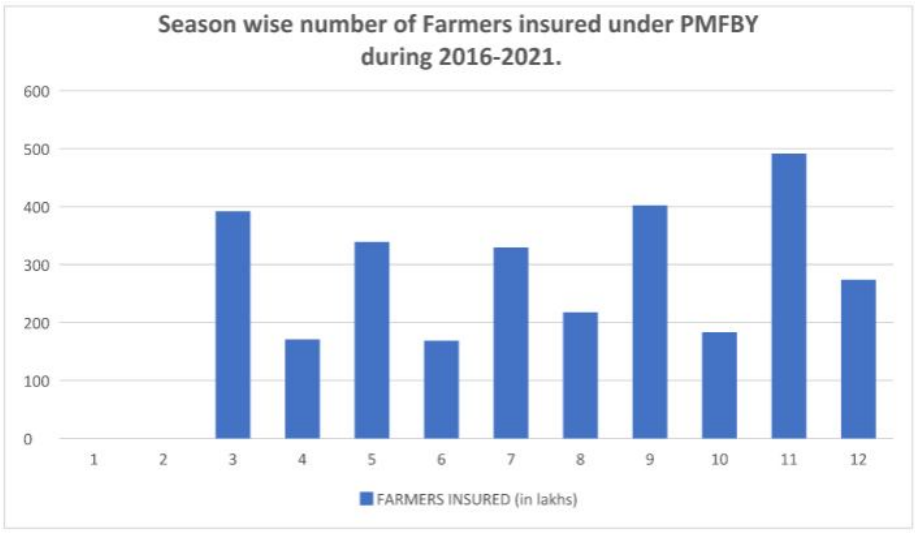

Figure – 1 Season wise number of Farmers insured under PMFBY

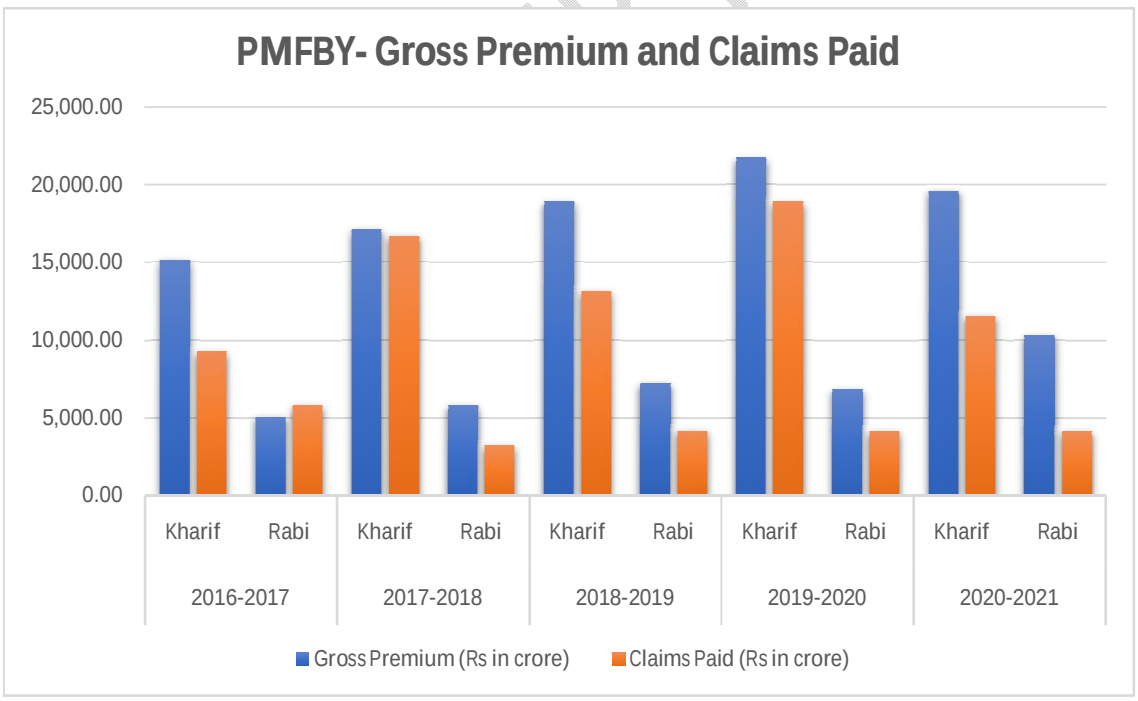

Figure -2 PMFBY Gross Premium and Claims Paid

Table – 1 Assessment of different Crop Insurance Schemes in India (2000-2021)

Scheme	Year	Farmers Insured (In lakhs)	Farmers Benefitted (In lakh)	Gross Premium (Rs. In lakh)	Claims Paid (Rs. in crore)	Beneficiary Ratio	Claim Premium Ratio
NAIS	2000-2001	110.8	42.17	239.94	1289.66	0.38	5.37
	2005-2006	167.22	36.68	554.77	1424.75	0.21	2.56
	2009-2010	239.34	90.11	1154.55	5118.11	0.37	4.43
WBCIS	2007-2008	6.709	2.20	145.48	104.15	0.32	0.71
	2011-2012	116.71	63.298	1844.31	1091.43	0.54	0.59
	2015-2016	90.30	75.190	7180.52	5386.41	0.83	0.75
MNAIS	2011-2012	12.29	2.23	286.97	179.50	0.18	0.62
	2013-2015	53.58	17.81	1074.47	1391.97	0.33	1.29
	2015-2016	86.15	40.45	1347.78	1812.20	0.46	1.34
RWBCIS	2016-2017	20.99	17.21	1631.78	1658.29	0.81	1.01
	2017-2018	20.22	15.89	2363.22	1871.82	0.78	0.79
	2018-2019	21.26	13.94	2891.56	2656.21	0.65	0.91
PMFBY	2016-2017	562.71	131.80	20,243.15	15,109.77	0.23	0.74
	2017-2018	507.73	159.04	22,986.39	19,943.71	0.31	0.86
	2018-2019	546.85	151.14	26,214.42	17,359.21	0.27	0.66
	2019-2020	283.60	223.20	32,012.00	25,546.00	0.78	0.79
	2020-2021	393.30	61.80	29,960.55	15,708.29	0.15	0.52

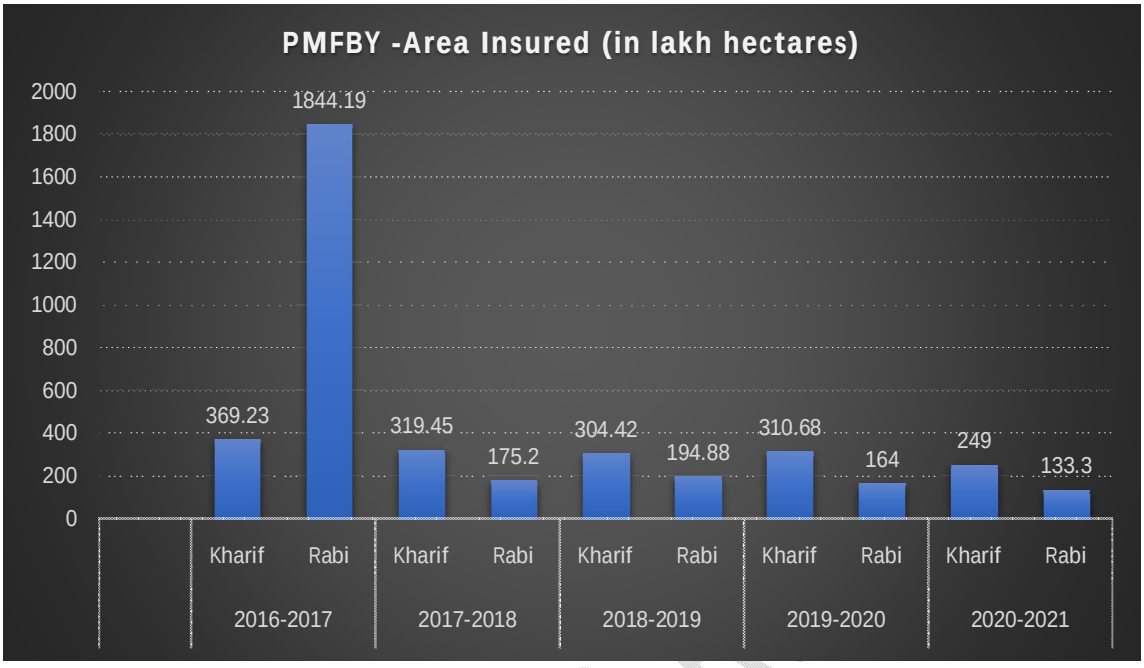

Fig. 3. PMFBY -Area Insured (in lakh hectares)

Table -2 Descriptive Statistics of Performance of Pradhan Mantri Fasal Bima Yojana (PMFBY)

Variable	Mean	Standard Deviation	CAGR	CV	Minimum	Maximum
Cumulative 2016-2022						
Farmers insured (in lakh)	578.75	35.48	2.52	6.13	527.12	612.90
Gross Premium (Rs. in crore)	27900.81	4242.72	9.96	15.21	21869.33	32012.00
Farmers Benefitted (in lakhs)	154.68	58.87	-13.89	38.06	61.80	223.20
Area insured (in lakh hectares)	507.01	50.97	-5.83	10.05	433.90	577.23

Table -3 The effects of insurance factors on PMFBY farmers

Year	Dependent Variable		Independent Variables		
Cumulative 2016-22	**Farmers insured**	**Constant**	**Gross Premium**	**Farmers Benefitted**	**Area Insured**
		716.72 (80.61)	0.0209** (0.023)	0.786** (0.054)	1.644* (0.12)
	Adjusted R^2	0.78			

Assessment of different crop insurance schemes-

Table -1 compares the coverage provided by various crop insurance programs from 2000–2001 to 2020–21. When compared to the number of farmers insured by the WBCIS (1.65 lahks), the number of farmers covered by the National Agriculture Insurance Scheme (NAIS) (129.92 lahks) increased during the kharif season of 2008–2009. In a similar vein, the area covered by the National Agricultural Insurance Scheme was much more extensive (176.36 lakh hectares) than the area covered by the Weather-Based Crop Insurance Scheme (WBCIS) (1.78 lakh hectares). During the rabi season, a consistent pattern was established for both the number of insured farmers and the amount of land that was covered. The Weather-based Crop Insurance Scheme (WBCIS) covered 53.99 lahks more farmers in Kharif 2015–16 than the Modified National Agriculture Insurance Scheme (MNAIS) did (48.12 lahks), according to a study of the two insurance programs.

The area that was insured by WBCIS (62.94 lakh hectares) was more significant than the area that was covered under MNAIS (55.30 lakh hectares); however, this tendency was reversed during the rabi season. In contrast, when RWBCIS and PMFBY were compared, it was found that more farmers were insured under PMFBY (329.49 lahks) than under RWBCIS (14.01 lakh) during the kharif season of 2018–2019. During the same season, the territory that was covered by PMFBY's insurance (304.42 lakh hectares) was much larger than the area that was covered by RWBCIS's insurance (14.72 lakh hectares). During the rabi season, the same pattern was discovered for the number of farmers and the amount of land insured. As a result, the data showed that the PMFBY had a higher number of farmers and an enormous amount of land that was protected compared to other crop insurance schemes.

Gross Premium and Claims paid

During the Kharif 2015–2016 period, the total gross premium collection amount for WBCIS was 986.56 crore, which was higher than the total gross premium collection amount for MNAIS, i.e., 807.16 crores. During the same season, the total amount of claims paid out under the WBCIS was more than the total amount of claims paid out under the MNAIS (which was 1127.16 crore). During the rabi season, it was discovered that the gross premium collection amounts and the claims paid followed a pattern with the same general direction. This demonstrates that during the 2015–2016 policy year, the WBCIS had a greater gross premium amount and higher claims paid out than MNAIS did.

During the 2018–2019 fiscal year, the total amount of gross premiums collected through PMFBY was more than that collected under RWBCIS (13,179.91 crore versus 1,720.99 crores). In a similar manner, the total amount of claims paid out by PMFBY in the same season was more (Rs. 4179.3 crores) than the amount paid out by RWBCIS (Rs. 935.22 crores). In the rabi season, a similar pattern was detected for gross premium collection amounts and claims paid; hence, the data suggest that the gross premium collection amount and claims paid were bigger under PMFBY than RWBCIS from 2015–2016 to 2020–2021.

From the above tables 2 and 3, the gross premium collected and claim payments made by the PMFBY for the kharif and rabi seasons over the years 2016 to 2021 have been analyzed. During the seasons of Kharif and rabi, the total amount of gross premiums collected saw an increase throughout the time period. The total amount of claims paid during the kharif season in 2016–2017 was lower than the total amount of claims paid during the

rabi season in 2017–2018; however, the figures below show that more claims were paid during the kharif season compared to the rabi season in 2017–2018; as a result, the gross premium collection amount was more significant than the total amount of claims paid under PMFBY during 2016–2017 to 2020–2021.

Beneficiary ratio and claim ratio

In addition, the ratios of beneficiaries to claim premiums have been considered while assessing the various crop insurance policies. To calculate the beneficiary ratio for a particular program, just dividing the total number of farmers who benefited from the program by the total number of farmers who were insured via that program. On the other hand, in order to determine the claim premium ratio, one must compare the total number of claims paid out to the total amount of gross premiums collected in accordance with a specific plan.

The ratios of those who benefit from the various crop insurance plans in India over the course of their existence, from 2000–2001 to 2020–21. When we evaluated the beneficiary ratios of several crop insurance schemes, we found that the ratio was bigger under RWBCIS than it was under PMFBY. This was the case even though the beneficiary ratios of all programs were lower than one. From 2016 to 2019, the ratios for RWBCIS ranged between 0.65 and 0.81, whereas the ratios for PMFBY during the same time period ranged between 0.23 and 0.3. On the other hand, the claim/premium ratios were greater than unity under NAIS (i.e., 5.37, 2.56, and 4.43 during 2000–2001, 2005–2006, and 2009–2010), which indicates that the total amount of claims paid by the insurance companies was greater than the premium collection amount. This was the case because the claim/premium ratios were greater than unity.

Under the WBCIS, the claim premium ratios were more than zero but less than one (ranging between 0.59 and 0.75 during 2007-2016). In the case of RWBCIS and PMFBY, it was discovered that the claim premium ratios were lower than one. Under PMFBY, the ratio was 0.66 in 2018–2019, which was lower than the ratio for RWBCIS (0.91 in 2018–2019). This indicates that the total amount of claims paid by insurance companies was lower than the premium collection amount; as a result, insurance companies received more profits under PMFBY during the period of 2016–2017 to 2020-21.

Conclusion

The Government of India has launched various crop insurance schemes intermittently to sustain the farmers' income levels. Currently, two crop insurance schemes are operating in India, i.e., Pradhan Mantri Fasal Bima Yojana (PMFBY) and the Restructured Weather-Based Crop Insurance Scheme (RWBCIS). As compared to previous schemes, the PMFBY has come up with modified features, i.e., one premium, one season; coverage of all kharif and rabi seasons and all annual commercial and horticulture crops; risks covered from the pre-sowing period to the post-harvesting period; use of modern technology for assessment of crop losses, such as drones and GPS; claims paid directly into farmers accounts; three levels of indemnity offered, namely 70 per cent, 80 per cent, and 90 per cent. To make it more successful and farmer-friendly, some new features have been added, such as voluntary participation for all farmers, business allocation to insurance companies for three years rather than one, linking with the Aadhaar card, mandatory requirements for states to pay subsidies on time, and flexibility for states to decide on additional risk coverage; however, we found that PMFBY showed limited success during 2016–2017 to 2017–2018.

Further, we found that the agriculture insurance coverage under PMFBY is still low in terms of farmers insured, area insured, claims paid and farmers benefitted. The beneficiary and claim premium ratios were found to be much lower under the PMFBY for the period of as compared to the ratios under the National Agriculture Insurance Scheme (NAIS), Weather-Based Crop Insurance Scheme (WBCIS), Modified National Agriculture Insurance Scheme (MNAIS), and Restructured Weather-Based Crop Insurance Scheme (RWBCIS). Through the multiple regression model, the effects of the characteristics of the PMFBY on the farmers' coverage were studied, showing that the farmers' premium had a significant effect on the number of farmers insured over the time period.

References

- Harold G. Halcrow. (1949) Actuarial Structures for Crop Insurance. American Journal of Agricultural Economics, Volume 31, Issue 3, Pages- 418-443.
- JunJie Wu. (1999) Crop Insurance, Acreage Decisions and Non-point Source Pollution. American Journal of Agricultural Economics, Volume 81, Issue 2, Pages 305-322.

- Enjolras, Geoffroy, Kast, Robert and Sentis, Patrick, (2009), Diversification in Area-Yield Crop Insurance: The Multi Linear Additive Model, Working Papers, LAMETA, University of Montpellier.

- Chang, H. H., & Mishra, A. K. (2012). Chemical usage in production agriculture: do crop insurance and off-farm work play a part? Journal of environmental management, 105, 76-82.

- Ke, W. A. N. G., Zhang, Q., Kimura, S., & Akter, S. (2015). Is the crop insurance program effective in China? Evidence from farmers' analysis in five provinces. Journal of Integrative Agriculture, 14(10), 2109-2120.

- Bokusheva, R., Kogan, F., Vitkovskaya, I., Conradt, S., & Batyrbayeva, M. (2016). Satellite-based vegetation health indices as a criteria for insuring against drought-related yield losses. Agricultural and Forest Meteorology, 220, 200-206.

- Li, H., Yuan, K., Cao, A., Zhao, X., & Guo, L. (2018). The role of crop insurance in reducing pesticide use: Evidence from rice farmers in China. Journal of Environmental Management, 306, 114456.

- Mukesh Kamal, P. (2019). Assessment of crop insurance in India through 4Cs: cost, coverage, compensation, and crop loss. Indian Journal of Agricultural Economics, 74(2), 256-266.

- Jørgensen, S. L., Termansen, M., & Pascual, U. (2020). Natural insurance as condition for market insurance: Climate change adaptation in agriculture. Ecological Economics, 169, 106489.

- Luckstead, J., & Devadoss, S. (2019). Implications of commodity programs and crop insurance policies for wheat producers. Journal of Agricultural and Applied Economics, 51(2), 267-285.

- Mahul, O., & Stutley, C. J. (2010). Government support to agricultural insurance: challenges and options for developing countries. World Bank Publications.

- Dandekar, V. M. (1976). Crop insurance in India. Economic and Political Weekly, A61-A80.

- Nair, R. (2010). Crop insurance in India: changes and challenges. Economic and Political Weekly, 19-22.

- Santhi, S. (1991). Comprehensive Crop Insurance in Agastheeswaram Block of Kanyakumari District–An Economic Appraisal. Unpublished M. Sc. (Ag) thesis submitted to Tamil Nadu Agricultural University, Coimbatore.

- Skees, J. R., & Hess, U. (2003). Evaluating India's Crop failure Policy. Focus on the Indian Crop Insurance program. delivered to the South Asia regiona of the world bank.

- Collier, B., Skees, J., & Barnett, B. (2009). Weather index insurance and climate change: Opportunities and challenges in lower income countries. The Geneva Papers on Risk and Insurance-Issues and Practice, 34, 401-424.

- Ghosh, R. K., Gupta, S., Singh, V., & Ward, P. S. (2019). Is there a market for multi-peril crop insurance in developing countries moving beyond subsidies? Evidence from India (Vol. 1820). Intl Food Policy Res Inst.

- Gulati, A., Terway, P., & Hussain, S. (2018). Crop insurance in India: Key issues and way forward.