Performance of National Agriculture Insurance Scheme (NAIS) Pradhan Mantri Fasal Bima Yojna (PMFBY) in Haryana: Way Forward for Cooperatives, Farmer Producer Organization, and Multistate Cooperatives

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Abstract

The PMFBY and the NAIS are the main themes of research on crop insurance in Haryana, India. The study employs a quantitative methodology and utilizes secondary data from multiple published sources, such as the Department of Agriculture and Cooperation and Farmers Welfare, the Ministry of Agriculture and Farmers Welfare, the Government of India, and the Agriculture Insurance Company.

Cumulative data from 2000 to 2022 is used to assess the efficacy of PMFBY and NAIS. Multiple regression analysis is used to create a model that estimates the influence of insurance features on farmer coverage. This model aims to shed light on the variables that affect farmer involvement and the effectiveness of crop insurance programs in reducing agricultural hazards.

The study's conclusions provide insight into the advantages and disadvantages of Haryana's present crop insurance programs. It is expected that the study would offer insightful information to insurance companies, agricultural stakeholders, and legislators, making it easier to create more inclusive and successful crop insurance plans that are suited to the requirements of Indian farmers.

Keywords: *agriculture, crop insurance, agriculture loans, farmers, India, performance, National Agriculture Scheme Insurance, PMFBY, Haryana.*

1. Introduction :

India's economy is based chiefly on agriculture because it supports two-thirds of its people. Even though it is actively pursuing agriculture, it falls behind in production as a percentage of the world's production of food grains. One of the leading causes is its susceptibility to natural disasters and seasonal difficulties. In India, natural adversities impact agriculture production and farm revenue. Agriculture is more vulnerable to natural and man-made

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calamities such as fires, disease outbreaks, and price collapses due to selling counterfeit seeds, fertilizers, pesticides, and other products. Its consequences include unpredictable productivity and a decline in farm income. These disasters annually cause damage to over 12 million hectares of cropland, which negatively impacts crop yields and agricultural production .

It is frequently believed that insurance is a valuable tool for decreasing and eradicating risk since it allows the losses incurred by a few to be covered by the contributions of a large group of similar individuals . Farmers are covered by agricultural insurance for any losses incurred in the industry, which covers a wide range of goals. In the subject of agricultural insurance, a variety of risk-transfer mechanisms are important. These include crop insurance, weather insurance, seed crop insurance, plantation insurance, horticulture, and floriculture insurance, agricultural tools insurance, etc.. In light of this, on January 13, 2016, the central government combined all previous crop insurance programs. It unveiled a brand-new program called the PMFBY, which has a better design and lower premium rates. Haryana State adopted the program beginning with the Kharif season. After learning from the earlier programs and having several conversations, PMFBY has emerged as the nation's most recent crop insurance model .

1.1 Literature Review

India has a difficult time guaranteeing food security because it is home to more than 33% of the world's undernourished children and ranks 94th in the 2020 Global Hunger Index. The agricultural sector is significantly at risk due to differences in market dynamics and development, which have an immediate impact on farmers' income levels . The impact of climate-related disasters on agriculture further compounds the agricultural risk, upon which 58% of the Indian population depends. Food security can be written as "everyone having physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary preferences and requirements for a healthy and active life,". Food security is predicted to be greatly impacted in the upcoming years by a number of environmental stressors, including rising food prices, shifting weather patterns, and an expanding global population. Crop insurance is one tool accessible to farmers to help reduce income insecurity.

Crop insurance refers to safeguarding farmers from monetary losses due to crop failure triggered by uncontrollable external factors . Crop yield should be the only thing covered by insurance, not the yield's revenue. A few key crops and a few chosen regions should be the only areas covered by the insurance, with enough risk spread, before further crops and regions are

added progressively. The scheme must to be appealing, linked to credit, and equipped with reinsurance and other support services .

Over the years, the Indian federal government and state governments have sought to put in place crop insurance programs for farmers. Initiated in 1972, the initial crop insurance pilot program encountered restricted success. It was replaced in 1978 by the Pilot Crop Insurance Scheme (PCIS). The Comprehensive Crop Insurance Plan, a national crop insurance program with an emphasis on the regions, was introduced in 1985 . However, there were numerous issues with the scheme, including the area approach, skewed indemnity payments to a specific state or crop, unchanging premium rates for all farmers and regions, coverage to a small number of crops and regions, restricted coverage to loanee farmers and their mandatory participation, and a lagged indemnity payment schedule .

In Rabi 1999–2000, this was substituted by the NAIS, which aims to give farmers a comprehensive insurance solution in a case when any of the crops fail or are damaged due to natural adversities, calamities, or a widespread outbreak of diseases and pests. Farmers who were not borrowers could also utilize it. It covered a variety of crops including horticulture crops . The NAIS was further modified in Rabi 2010–11 to become the Modified National Agricultural Insurance Scheme. Along with these initiatives, several additional pilot projects were also periodically implemented, such as the Farm Income Insurance Scheme (Rabi 2003–04), the Weather Based Crop Insurance Scheme (Kharif 2007), and the Seed Crop Insurance (1999–00) . All of the programs covered an average of 47 million hectares, or 39 million farmers, over the course of three years, from 2013–14 to 2015–16. Most farmers were left without significant insurance coverage due to high premium rates (8–10%) under MNAIS and WBCIS, protracted claim settlement delays (6–12 months), insufficient sum insured and their capping under MNAIS, and a lack of government support in the form of premium subsidies .

The Indian government launched the PMFBY in 2016 after understanding the deficiencies of the current crop insurance system. The program has novel elements and was initially budgeted Rs. 5500 crores for the 2016–2017 fiscal year. This scheme provides the most uniform premium rate in all of India along with a thorough risk protection strategy. Other crop insurance programs, like the NAIS and the MNAIS, which had a number of intrinsic drawbacks, have been superseded by PMFBY. The insurance program includes all types of farmers, including sharecroppers, tenants, and those with and without loans. It runs on a regional scale. The fact that losses

incurred by farmers at any point during the farming process, from seeding to the post-harvest season, would be covered was another advantage of the new crop insurance program. Prior to this, the insurance facility could only be used to offset post-harvest losses under the two current schemes. Additionally, farmers who have not taken out bank loans will be qualified for PMFBY insurance coverage . Initially, non-loanee farmers might choose to do it, but loanee farmers who had obtained credit from any financial institution were required to do so. But starting with the 2020 kharif season, loanee farmers could choose not to participate .

The PMFBY has faced a number of difficulties. The main problem is how hard it is to guarantee that the plan is widely adopted. Data from the first year of PMFBY, showed that agricultural insurance coverage had increased over the previous year in terms of the number of farmers insured, the area covered, the number of Paid claims, and the rewards received; however, by kharif 2017, these figures had fallen. The main cause of the program's decreased coverage is a lack of knowledge. A coordinated awareness effort by state, federal, and insurance organizations is required to solve this, particularly in rural regions .

Concerns have been expressed by a number of states over the fact that insurance company claims payments are significantly less than gross premiums (GP) received. The fact that farmers make relatively small contributions to the GP has an impact on government subsidies. States and the federal government both set aside a sizable amount of money for premium subsidies. One of the first states to break away from the PMFBY was Bihar. The Bihar Rajya Fasal Sahayata Yojana (BRFSY) was launched by the state government during the Kharif season of 2018–19 (Hussain, 2020). Compared to June 2020, Bihar had a 73% excess of rainfall as opposed to a 40% shortage in the preceding year. Farmers took advantage of the plentiful rainfall to begin paddy transplanting early. This scenario will test Bihar's recently implemented plan. The state administration will have a difficult time making up for the massive crop damage given the financial load the COVID-19 pandemic has placed on the state .

Programs for crop insurance were created to mitigate issues that impair the productivity of the agriculture industry and lessen the negative financial effects they have on farmers. These programs seek to create investments that can speed up recovery and productivity after a difficult farming season in addition to stabilizing farm income. In order to adapt to evolving conditions, the Government of India (GoI) has been modifying its crop insurance programs on a regular basis. Despite the substantial amount of material that has been published, the aim is to concentrate on the effectiveness of the two

crop insurance programs. Based on the research mentioned above, it can be concluded that most studies on crop insurance systems are conducted for India, with a little amount of study being done about the performances of the states.

2. Objectives

In the paper, we attempt to highlight the significance of agriculture insurance in India and provide a quick overview of how the industry has changed over time as a result of many experiments. By examining how the NAIS, India's main crop insurance program, performed in various states, it also discusses the performance of the NAIS and the transition to the PMFBY.

The research objectives of this paper are as follows:

1. To study the impact of insurance characteristics like premium paid by farmers, claims and subsidy on farmer coverage under the National Agriculture Insurance Schemes in India through multiple regression model.
2. To evaluate the performance of the NAIS and PMFBY in the state of Haryana.

3. Methodology :

Using a quantitative methodology, the study is backed by secondary data that was compiled from several published sources. Among these secondary sources are the Department of Agriculture and Cooperation and Farmers Welfare, the Ministry of Agriculture and Farmers Welfare, the Government of India, and the Agriculture Insurance Company. The relevant articles were gathered using the keywords "Crop Insurance," "Agriculture Loans," "National Agriculture Schemes," and "India". Important data was collected from government ministry websites and yearly reports. Using these sources, the results are reviewed in the results and discussion section.

Cumulative data is utilized to do a multiple regression analysis and create a model to predict the effects of insurance characteristics like farmers' premium, paid claims and subsidy on farmer coverage from 2000 to 2022 in order to assess the effectiveness of the two national schemes- PMFBY and NAIS. Using cumulative data as follows, multiple regression analysis is used to determine the effects of insurance characteristics on farmers' coverage under NAIS and PMFBY. The equation of the model is as follows:

Farmers insured under Indian agricultural insurance schemes = $\beta 0 + \beta 1(\text{Farmers Premium } t) + \beta 2(\text{Paid claims } t) + \beta 3(\text{Government Grants } t) + u\,t$, where u is the error term, and t refers to the years.

Following the formulation of the model, the data for the state of Haryana is to be studied and evaluated. The data used for the study of agricultural insurance in Haryana is the yearly NAIS data from 2000 to 2016 of Haryana for both Rabi and Kharif seasons. Similarly, yearly data of PMFBY of Haryana from 2016 to 2022 for the Rabi and Kharif seasons has been used. The viewpoints on Haryana's current agriculture insurance programs from the standpoints of performance analysis is reviewed in this research along with supporting literature, descriptive statistics and using Claim Ratio and Beneficiary Ratio,

where,

Claim Ratio = Claim Paid / Premium Paid

Beneficiary Ratio = Total number of farmers benefited / Total number of farmers

4. Data Analysis and Findings:

4.1 Assessment of Multiple Regression Model:

A multiple regression model was created using cumulative data to determine the impact of insurance features on farmer coverage from 2000 to 2022. The multiple regression model for the farmer coverage is as follows:

Farmer's coverage = β0 + β1(Farmers Premium t) + β2(Paid claims t) + β3(Government Grants t) + u t, where, u is the error term and t refer to the years.

After the regression analysis, the results derived from the model are depicted in Table 1:

Table 1: Summary Output from the Multiple Regression

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.970037774
R Square	0.940973283
Adjusted R Square	0.931653275
Standard Error	6117368.347
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	113347391314240000.00	3778246377141350.00	100.96	0.00
Residual	19	711021714372406.00	37422195493284.50		
Total	22	120457608457964000.00			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	11415532.25	2724385.457	4.190131107	0.0004964	5713327.955	17117736.54	5713327.955	17117736.54
Farmers Premium	135.953214	40.62633071	3.346431037	0.0033911	50.92132661	220.9851015	50.92132661	220.9851015
Paid Claims	-13.95322641	3.859492448	-3.615300871	0.0018431	-22.03123694	-5.875215879	-22.03123694	-5.875215879
Government Grants	10.64824649	4.113381284	2.588684528	0.0180147	2.038840516	19.25765246	2.038840516	19.25765246

Source: Regression of Secondary data in Table A1 in Appendix A

From the summary output it can be observed that the value of Multiple R is 0.97 which shows a strong linear relationship between the farmers coverage and the insurance characteristics i.e. farmer's premium, Paid claims and subsidy. Further, the Adjusted R Square value is 0.9316, which implies 93.16% variability in farmers coverage by the insurance characteristics. The significance of the model can further be supported by Significance F value of 0.00, which is less than the common significance level of 0.05 and therefore ideal. Hence, the overall model is significant and variability in farmer's premium, Paid claims and Government Grants (subsidy) have a significant impact on Farmers Coverage.

The variables that have been selected in the multiple regression model are farmer's premium, Paid claims and subsidy. Through the ANOVA table it can be observed that all the variables are statistically significant as the p values of all the variables are less than 0.05. This indicates that the regression model as a whole is statistically significant. Therefore, the estimated regression equation for Farmer Coverage under the agriculture insurance schemes is as follows:

Farmer's coverage = 11415532.25 + 135.95(Farmers Premium) - 13.95(Paid claims) + 10.65 (Government Grants)

The above regression implies that while the Farmer's Premium and Subsidy by the Government have a significant positive impact on the coverage, the Paid claims have shown a negative impact on the coverage under the agriculture insurance schemes. The coefficients of the variables imply that keeping other variables constant, one unit change in Farmers Premium will result in an increase of 135.95 units in coverage. Similarly, for Claim Paid, keeping other variables constant, one unit increase in Claim Paid can result in decrease in coverage by 13.95 units and an increase in one unit of subsidy, keeping other variables constant, can result in increase in coverage by 10.65 units.

Hence, while Framers Premium and Subsidy have a positive impact on Farmers Coverage, Claim Paid has a negative effect on the Coverage. This could be explained by the fact that the Paid claims are determined by other factors such as natural calamities, rainfall, etc. Nevertheless, the formulated model is significant and is supported by significant values of Multiple R, Adjusted R Square and p-values.

Compiled data for NAIS and PMFBY:

Table 2: Total premium paid and Paid claims under both the schemes

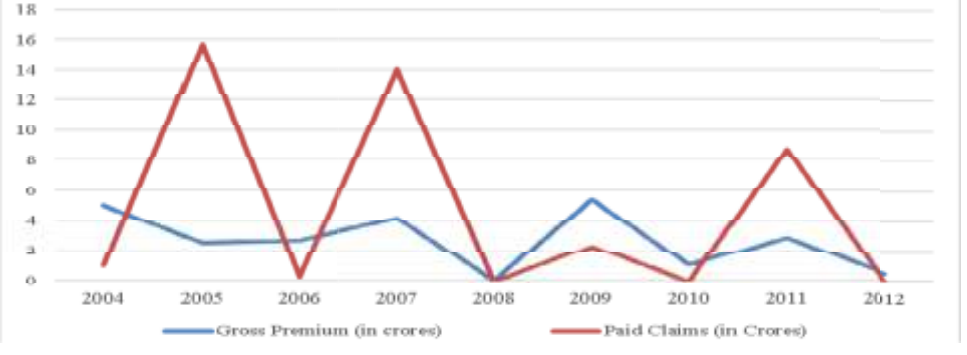
Schemes	Year	Premium (In crores)	Claim (in crores)	Claim Ratio
National Agricultural Insurance Scheme	1999-2016	5,584	20,437	3.66
Pradhan Minister Fasal Bima Yojna	2016 onwards	31139	155977	5.01

Using premium paid and Paid claims, Claim Ratio has been calculated for both the schemes. The claim ratio for NAIS is 3.66 while the claim ratio for PMFBY is 5.01. The high value of claim ratio under the PMFBY imply that the scheme has provided better returns in just 7 years as compared to NAIS in 16 years which has a lower value of claim ratio.

4.2 Assessment of Crop Insurance in Haryana

The gross premium collecting amounts and Paid claims under the PMFBY from 2016 to 2022 and NAIS from 2000 to 2012 in Haryana are presented in Figures 1 and 2.

Figure 1: Gross premium collection amount and total amount of Paid claims under NAIS

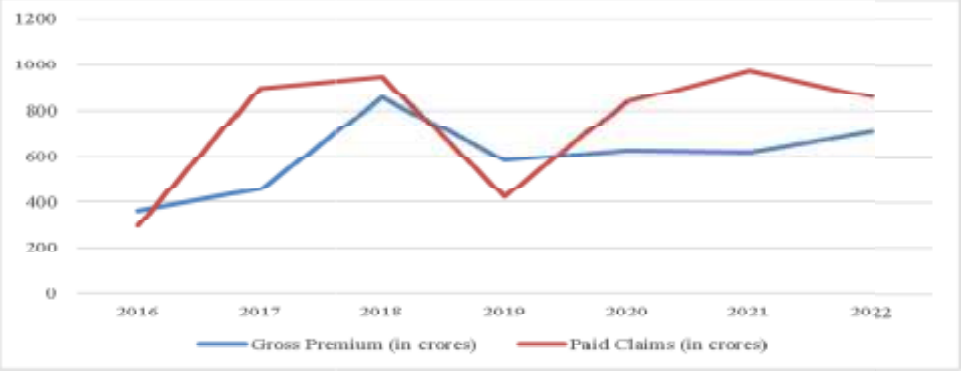


Source: Graphs plotted from data in Table A2 and Table A3 in Appendix A

In Figure 1, the Paid claims has shown inconsistencies and have occasionally been lower than the gross premium collected under NAIS in Haryana. The gross premium collection amount (blue line) appears to be higher than the total number of Paid claims (orange line) throughout the entire period. There is some variation in the gap between the two lines from year to year, but overall, the gross premium collection amount seems to be consistently higher.

Figure 2: Gross premium collection amount and total amount of Paid claims under

PMFBY



Source: Graphs plotted from data in Table A2 and Table A3 in Appendix A

In Figure 2, under PMFBY, over the period, the gross premium collection amount grew. The paid claims have been higher than the premium collected expect the dip observed in 2019. Hence, better results have been observed under PMFBY as better coverage in terms of Paid claims has been observed.

Overall, in terms of gross premium collected and paid claims, PMFBY has shown better efficiency in Haryana as there can be observed huge gap in the amount collected and Paid claims under both schemes.

4.3 Beneficiary Ratio and Claim Ratio:

Table 3 shows the claim ratio and beneficiary ratio for agricultural insurance schemes NAIS and PMFBY.

Table 3: Claim Ratio and Premium Ratio under NAIS and PMFBY in Haryana

Year	Claim Ratio	Beneficiary Ratio	Year	Claim Ratio	Beneficiary Ratio
National Agriculture Insurance Scheme			Pradhan Mantri Fasal Bima Yojna		
2004	0.20	0.10	2016	0.82	0.17
2005	6.10	0.26	2017	1.98	0.24
2006	0.12	0.02	2018	1.10	0.29
2007	3.38	0.39	2019	0.73	0.36
2008	0.00	0.00	2020	1.34	0.36
2009	0.42	0.07	2021	1.57	0.48
2010	0.01	0.11	2022	1.22	0.25
2011	3.03	0.30			
2012	0.00	0.03			

Source: Calculations from data from Table A4 and Table A5 in Appendix A

Claim Ratio likens the amount of money paid out in claims to the amount of money collected in premiums. A ratio higher than one signifies that the program disbursed more claims than it received in premium payments. If the ratio is less than one, it means that the scheme made more money from premiums than it did from claims payments. Conversely, the Beneficiary Ratio contrasts the number of farmers who were insured under the system with the number of farmers who received a claim payout. A greater percentage of insured farmers receiving a payout is indicated by a higher beneficiary ratio.

In four out of nine years under NAIS, the claim ratio was more than one (2004, 2005, 2007, 2011). This implies that during those years, the program paid out more claims than it took in from premiums. The beneficiary ratio was generally low, hovering around 0.30 or less. This suggests that even in years when the scheme paid out a lot of claims, a relatively small proportion of insured farmers benefited.

Under PMFBY, the claim ratio was greater than 1 in all seven years. This suggests that the scheme consistently paid out more in claims than it collected in premiums. The beneficiary ratio was generally higher than under NAIS, ranging from 0.17 to 0.48. This suggests that a larger proportion of insured farmers received a payout under PMFBY. While, PMFBY has presented better results, it is important to note that additional factors, such as the types of crops covered by the schemes and the overall weather conditions in a given year, would also need to be considered.

4.4 Descriptive statistics

Table 4 provides descriptive statistics that summarises data on NAIS and the PMFBY in Haryana.

Table 4: Descriptive Statistics

Variables	Mean	Standard Deviation	Kurtosis	Skewness	Minimum	Maximum
			National Agriculture Insurance Scheme			
Total No. of Farmers	70659.38	63311.14	-1.57	0.37	2000.00	169000.00
Gross Premium	2.99	1.98	-1.25	-0.27	0.06	5.36
Paid Claims	4.73	6.95	-0.77	1.20	0.00	15.66
			Pradhan Mantri Fasal Bima Yojna			
Total No. of Farmers	1019015.29	334258.92	-2.60	0.40	701554.00	1442500.00
Gross Premium	600.15	161.16	0.17	0.08	363.42	856.46
Paid Claims	746.25	270.67	-0.48	-1.18	296.94	969.41

Source: Calculations from data from Table A4 and Table A5 in Appendix A

The numbers of farmers insured ranged from 701554 to 1442500, with an average of 10119015 for the PMFBY, and ranging from 2000 to 169000 with an average of 70659 for NAIS in Haryana. Hence, the average number of farmers enrolled in NAIS was substantially lower than PMFBY (around 70,659 compared to 1,019,015). Therefore, lower coverage can be observed under NAIS. The average gross premium paid by farmers enrolled in NAIS was much lower than PMFBY (₹2.99 compared to ₹600.15). This could be because the NAIS scheme offered lower coverage or insured a smaller variety of crops. The average amount paid out in claims by NAIS was lower than PMFBY (₹4.75 compared to ₹746.25). This could be due to a number of reasons, including the lower gross premiums collected or the possibility that NAIS offered lower coverage limits.

4.5 Discussion:

Given the significant role crop insurance can play in lowering farmers' risks, the Government of India launched the NAIS in Haryana with the intention of improving the Comprehensive Crop Insurance Scheme (CCIS). However, the reality was that the NAIS merely replaced a less effective program with a more effective one. The primary shortcomings were the area strategy, arbitrary premiums, the requirement, the inability to manage adverse selection, and the objective of financial viability. Additionally, price changes have a significant impact on farmers' revenue, which means that market risk will have an impact on their future profits.

In February 2016, the Indian government introduced PMFBY to expand crop insurance coverage and improve its efficacy. Several states, including Haryana, postponed it by more than a month. Furthermore, disagreements among insurance firms on the yield data 11 supplied by the States frequently occur, leading to disagreements and postponements in the resolution of claims. Another issue is the inability of the States to pay their share of the premium on time prevents insurers from processing claims. There were outstanding claims totalling Rs 3,008 crore against a total of Rs 4,602 crore in state subsidies between 2016 and 2020. States were required to pay their contribution for Kharif 2017 by December 2017, but several did not. According to a representative of a crop insurance business, Bihar, Madhya Pradesh, Telangana, West Bengal, and Andhra Pradesh were among the states that had not paid their payment for Kharif 2017 till the first week of June .

The National Government's premier crop insurance program, PMFBY, was introduced with tremendous enthusiasm, but it has encountered numerous difficulties. The most difficult duty is covering the Yojana. While the study's data indicated that during the first year of PMFBY 2016–2017, agricultural

insurance coverage grew in kharif 2016 compared to kharif 2015 in terms of farmers covered, area insured, Paid claims, and farmers benefited, in kharif

2017 it declined (Bhushan & Kumar, 2017). According to data provided by NAIS, the PMFBY insured 47.5 million hectares in 2017–18, equivalent to 24 per cent of the GCA of 198.4 million hectares. Following the introduction of the PMFBY in February 2016, the covered area increased from 23% under the previous schemes to 30% in 2016–17. However, from 2019, GCA coverage has seen a decrease, i.e., there has been a decline in total area coverage from 567.2 Lakh Ha in 2016-17 to 508.3 Lakh Ha in 2017-18 and subsequently to 497.5 Lakh Ha in 2019-20 .

The primary cause of the scheme's reduced coverage is a lack of awareness. An awareness campaign about PMFBY in rural areas needs to be launched by state governments, the federal government, and insurance firms . Increased usage of digital media could aid in raising farmers' knowledge of these programs given the pervasiveness of social media platforms in rural areas. Regular data updates on the PMFBY portal are necessary, and social media accounts for this portal are also required to promote awareness about this yojana .

5. Future Role of Cooperatives, Farmer Producer Organization, and Multistate Cooperatives for PMFBY Performance :

Farmer Producer Organizations (FPOs), and multistate cooperatives play an important role because they make it easier for farmers to receive agricultural insurance plans like the Pradhan Mantri Fasal Bima Yojana (PMFBY). Small and marginal farmers can combine their resources through FPOs and negotiate better terms with insurance carriers. This group's combined negotiating power may result in better coverage alternatives and more favorable premium pricing under PMFBY. Through workshops, training sessions, and educational campaigns, farmer clusters can inform their members about the program, how to apply, how to file a claim, and the benefits of holding crop insurance. Cooperatives and FPOs can expedite the PMFBY enrollment process. They can help individual farmers participate in the program more easily by assisting with the collection and submission of necessary documentation, making sure that application forms are accurately filled out, and enabling digital enrolment. Farmer clusters can also provide aggregated data on yield, crop trends, and other relevant indicators. Insurance firms can better assess risks and design insurance plans that cater to the needs of the local farming community by using this data. One of the challenges with crop insurance is the claims process. Cooperatives and FPOs are examples of intermediaries that can assist in ensuring that claims are filed

promptly and accurately. They can support farmers in obtaining relevant documentation, such as crop damage reports, and in following up with insurance companies to expedite claim settlements. By participating in PMFBY through farmer clusters, farmers can work together through FPOs to cooperatively manage and mitigate risks associated with crop failures caused by natural calamities. By distributing the risk across the community as a whole, this cooperative strategy offers a safety net for each individual.

The study of farmer clusters in Punjab provides an example of enhanced implementation efficiency of agricultural policies. Punjab Markfed and Punjab Agro Industries Corporation (PAIC) are two FPOs that have contributed to the increased acceptance and effectiveness of PMFBY. One of the largest cooperative organizations in India, Markfed, has been instrumental in offering farmers a variety of services and supplies for their crops, including easier access to insurance policies. Through its several initiatives, PAIC supports Punjabi FPOs by providing them with the resources and expertise required to fully utilize initiatives such as PMFBY.

The numerous rival programs that state governments have introduced, in which they pay the full premium costs on behalf of the farmers, provide the PMFBY with still another significant obstacle. These include programs like the YSR Free Crop Insurance program in Andhra Pradesh, the West Bengali Bangla Shasya Bima scheme, the Gujarati government's Mukhya Mantri Kisan Sahay Yojana, and the Bihar Rajya Fasal Sahayata Yojana of the Bihar government . Due to their much higher share of the high actuarial premium rate under PMFBY, several states launched their own crop insurance programs.

Additional shortcomings of the PMFBY include the system's complexity and claim settlement delays. Farmers' resistance to the policy can be attributed, in large part . As per the recently revised PMFBY standards for 2020, state governments cannot participate in the program in subsequent seasons if they do not release the subsidy share to the insurance companies within the stipulated timeline. This significantly enhances the Yojana rules, necessitating close attention to detail. In light of India's rapidly increasing population, limited resources, concerns about climate change, and the COVID-19 pandemic, it is imperative that food security be given top priority as a fundamental policy goal.

6. Conclusion

The Indian government has periodically introduced a number of crop insurance programs since independence in an effort to maintain farmers'

income levels. The two main national schemes include the the NAIS and the PMFBY. The features that have been changed from NAIS to PMFBY include a single premium for a single season, coverage for all annual commercial and horticultural crops as well as kharif and rabi seasons, risks covered from pre-sowing to post-harvest, use of modern technology, like drones and GPS, for crop loss assessment, direct payment of claims into farmers' accounts, and three levels of indemnity—70, 80, and 90 percent. Some of the new features that have been added to make it more successful and farmer-friendly are the linking of Aadhaar cards, business allocation to insurance companies for three years instead of one, mandatory requirements for states to pay subsidies on time, flexibility for states, and voluntary participation for all farmers.

This study was an attempt to assess the effectiveness of crop insurance schemes in India, particularly focusing on the NAIS and the PMFBY, with a specific look at their implementation in Haryana. In order to determine how insurance features affect farmer coverage, the analysis used a multiple regression model. It also assessed the claim and beneficiary ratios for each scheme. The developed multiple regression model exhibited a strong positive relationship between farmer coverage and insurance characteristics like farmer premium, Paid claims, and subsidy. This suggests that these factors significantly influence farmer participation in crop insurance schemes. The model coefficients indicated that an increase in farmer premium and government grants leads to a rise in farmer coverage, while an increase in Paid claims has a negative impact. This implies that while farmers are incentivized by higher premiums and subsidies, frequent claim payouts might discourage participation due to potential risk aversion.

Analysis of claim ratios revealed a more favourable outcome under PMFBY compared to NAIS. PMFBY consistently paid out more in claims than collected premiums, demonstrating its focus on farmer benefits. However, NAIS only achieved this feat in a few years. Beneficiary ratios under PMFBY were also generally higher than NAIS, indicating that a larger proportion of insured farmers received claim payouts under the newer scheme. This suggests potentially better outreach and claim settlement processes with PMFBY. Further, descriptive statistics highlighted a substantial difference in farmer enrolment between the schemes.

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