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An Evaluation of Restructured Weather-Based Crop Insurance Scheme (RWBCIS) In Karnataka

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Abstract

Objectives: *The present study is conducted to evaluate the RWBCIS from the perspective of peasants' participation, the number of farmers who benefited and the amount insured, and the claimdeclared.*

Research Methodology: *The current research work used an analytical research design. The study foundation is secondary data and the required data is accumulated from the PMFBY website. To validate the developed research hypotheses, the chi-square statistical test and one sample t-test have been employed. The hypothesis result is also supported by the Compound Annual Growth Rate (CAGR).*

Research Findings: *The researcher revealed that a large number of farmers participated throughout the Kharif period rather than the Rabi, the claim-to-sum insured and claim-to-premium ratio was reduced during the Kharif period. The study also found that there is no growth in farmers' participation and no association between seasons and the number of farmers who benefited from the RWBCIS.*

Key Words: *Crop Insurance, RWBCIS, Agriculture, Agriculturists, Loanee farmers, Non-Loanee farmers, Claim- to -Sum Insured ratio, Claim-to-Premium ratio, and Beneficiary ratio.*

1 Introduction

India is a country of agriculturalists, with sixty percent of the people living there depending on farming in one way or another for their basic necessities as well as their monetary and other requirements.

eighteen percent of India's GDP comes from the farming sector, which also generates the majority of the nation's job opportunities. The agricultural industry is vulnerable to numerous hazards & issues, including erratic rainfall, temperature swings, snowfall, storms, flooding, droughts, crop failure, unfavorable crop pricing, low yields, low returns, etc. The handling of potential risks associated with farming is an essential concern for resolving the issue of farmer poverty since peasants are susceptible to these hazards, which not only jeopardize their livelihoods and earnings but also destabilize the farming sector. The GOI has taken various steps to condense these jeopardies, including announcing a crop insurance program just after freedom in 1947. Thus, the current research made an effort to evaluate one of the crop insurance called the RWBCIS. Thepresent research work is organized in the following order, introduction, review of literature, Research gap, RWBCIS - an overview, objectives, Research hypothesis, Research Methodology, Result and Discussions, Testing of Hypotheses, followed by conclusion.

2 Review of Literature

Chandrakanth and Rebello (1980) stated that among the hazards to be insured may be crop loss as a result of drought, heavy rainfall, insects, & pathogens. They opined that the compensation payable ought to be reimbursed for the expenses incurred until the sowing phase when the whole harvest is destroyed. Another outcome was that all debtors should, at the very least, be required to get crop insurance. According to Subrahmanian (1984), the premiums ought to be updated every year in accordance with agricultural costs and the mean yield over the long run. Coverage is measured in India exclusively as a proportion of the for a long time average. However, as well as a long-term mean output, it would be preferable to determine the coverage level based on price per unit of output and cultivation costs. According to Dandekar (1985), the taluka or tehsil is considered to encompass the geographical region for the purposes of the crop insurance plan, which relies upon the area approach. The mean yield for the region is used to calculate compensation owed to farmers; yield variances within the region are disregarded. This approach is seen as inadequate. Venkatesh and Rasheed (2021) Applying the coverage-risk connection, the researchers assessed the degree of crop insurance coverage and agricultural risk in 17 of the biggest states in India to look for signs of unfavorable selection. According to the research, every state has a different amount of risk and insurance coverage,

with higher levels of insurance coverage in high-risk states. A correlation of 0.492 was found between risk and coverage. Bhuiyan et al., (2022) The goal of the research was to ascertain whether or not farmers' revenue increases are significantly influenced by crop insurance. The system generalized moment estimation (GME), panel fixed effects, and ordinary least squares method (OLS) were used by the scholar for the assessment. The outcomes of the study demonstrated that higher crop insurance density and per capita payments have a noteworthy constructive impact on peasants' growth in income. Meena et al., (2022) The study examined the knowledge and attitude of farmers towards PMFBY in the Washim district of Maharashtra state. The authors discovered that the mainstream of the respondents have an average level of familiarity and a modest level of attitude with respect to PMFBY. Furthermore, most of the respondents have a favorable attitude toward crop insurance. Kaour et al., (2021) noted that subsidies had no discernible impact on agriculturalists' insurance involvement, but premiums have a great influence on the number of agriculturalists covered over a period. The PMFBY's main flaws are insufficient knowledge among agriculturalists, systemic complexities, and delays in claim settlement.

3 Research Gap

In keeping with the aforementioned, a few more scholars have focused on various facets or aspects of crop insurance. However, no researcher tried to evaluate the RWBCIS in Karnataka by taking into account agriculturalists' involvement, and the entire number of benefited agriculturalists. So, the current investigation has been undertaken to bridge this research gap as much as possible.

RWBCIS – An Overview

Since Kharif 2016, the Government of India has been administering the RWBCIS India, improving the WBCIS with the goal of safeguarding agriculturalists from predicted harvest losses due to adverse environmental factors such as precipitation, temperature, as well as the level of humidity. The current technique is based on an area method and uses meteorological parameters as substitute indicators for crop output comparison.

Aims

The plan is designed to protect insured peasants from monetary losses due to crop loss caused by adverse environmental factors such as precipitation, wind, temperature, moisture, and soon. RWBCIS compensates farmers for perceived crop losses by using meteorological parameters as a "proxy" for crop production. Pay-out

frameworks, i.e. Term Sheets, are created to the amount of losses judged to have occurred, preserving meteorological triggers as per crop requirements and comparing it to real climate information for the particular time frame.

Coverage of Farmers

Agriculturalists who cultivated informed crops in the declared region, involving sharecroppers and tenants, were qualified for protection. Producers who obtain agricultural loans for declared crops in recognized areas are required to be covered, while agriculturalists who do not obtain crop loans at the agriculturalist's discretion are also protected.

4 Research Objectives

- To understand the farmers' participation in the RWBCIS in Karnataka.
- To determine the farmers' beneficiary ratio in Karnataka with respect to the RWBCIS.
- To work out the Claim-to-sum insured Ratio and Claim-to-premium ratio.

5 Research Hypotheses

- H0: There is no growth in farmers' participation in the RWBCIS.
- H0: There is no association between seasons and farmers' who benefited from the RWBCIS.

Sub Hypotheses

In order to authenticate the first research hypothesis, the subsequent sub-hypotheses are framed.

- H0: There is no growth in Loanee and Non-Loanee farmers' participation in the RWBCIS duringthe Kharif Period.
- H0: There is no growth in Loanee and Non-Loanee farmers' participation in the RWBCIS duringthe Rabi Period

6 Research Methodology

The present research follows an analytical research design. The data used in the current research is gathered from secondary sources. The printed materials of the Agriculture Insurance Company, PMFBY, research papers, etc. are the key secondary sources. In order to validate the hypotheses, a chi-square test and a one-sample t-test have been carried out.The CAGR technique has been performed to support the hypothesis result.

7 Results and Discussions

As earlier noted, this particular research evaluates the RWBCIS from multiple vantage points of (i) farmer involvement and (ii) the number of farmers who profited from the plan. (iii) claim-to-premium and claim-to-sum insured ratios; the last section tests the hypothesis that was developed

(i) Farmers' participation in the RWBCIS

Table 1. Loanee and Non-Loanee farmers' participation

Year /Season	Kharif			Rabi			Total
	Loanee Farmers ’(A)	Non-Loanee Farmers’ (B)	Total (A+B)	Loanee Farmers, (C)	Non-Loanee Farmers’ (D)	Total (C+D)	Total (Kharif +Rabi)
2016	Not implemented in the state			1429	1310	2739	2739
2017	Not implemented in the state			1763	690	2453	2453
2018	Not implemented in the state						
2019	6561	20454	27015	Not implemented in the state			27015
2020	50854	13644	64498	6	17	23	64521
2021	97967	17836	115803	11	54	65	115868
2022	93141	20055	113196	9	68	77	113273
CAGR	**0.941**	**-0.005**	**-**	**-0.637**	**-0.447**	**-**	**-**
Total	**248523**	**71989**	**320512**	**3218**	**2139**	**5357**	**325869**

Source: Data Compiled from Pradhan Mantri Fasal Bima Yojana Website

The above table exhibits the farmer's participation in RWBCIS during the different seasons from 2016 to 2022. The total number of farmers who participated in RWBCIS was 3,25,869. There were 3,20,512 farmers who insured their crops during the kharif period, out of which 2,48,523 were loanee farmers and the remaining 71,989 were non-loanee farmers. On the opposite side, 5,357 farmers insured their crops during the rabi period, out of which 3,218 were loanee agriculturalists and 2,139 were non-loanee agriculturalists.

In a nutshell, it can be said that the majority of the farmers were insured their crops during the Kharif period than the Rabi period. Further, in both the Kharif and Rabi periods loanee farmers participated in significant numbers

(i) Number of farmers’ who participated, Number of farmers’ who benefited and Beneficiary ratio

Table 2. Farmers' Beneficiary Ratio

Year /Season	Kharif			Rabi		
	No. of farmers' Participated	**No. Of Farmers'Benefited**	**Farmers' Beneficiary ratio (%)**	**No. of farmers' Participated**	**No. Of Farmers'Benefited**	**Farmers'Beneficiaryratio (%)**
2016	Not implemented in the state			2739	2275	83.06
2017	Not implemented in the state			2453	2443	99.59
2018	Not implemented in the state					
2019	27015	25254	93.48	Not implemented in the state		
2020	64498	60480	93.77	23	23	100.00
2021	115803	84607	73.06	65	65	100.00
CAGR	**-**	**0.50**	**-**	**-**	**-0.59**	**-**
Total	**207316**	**170341**	**82.16**	**5280**	**4806**	**91.02**

Source: Data Compiled from Pradhan Mantri Fasal Bima Yojana Website

The above table depicts the farmer's beneficiary ratio in the Kharif and Rabi Periods. During the Kharif period, even though a large number of farmers benefited, there was a lower beneficiary ratio in 2021. However, in contrast, there were a minimum number of agriculturalists who profited in 2019, even though a higher beneficiary ratio was documented there as compared to the remaining years of the study period. During the period of Rabi, the least number of beneficiaries were recorded in 2016, and 100% of beneficiaries were recorded in 2020 and 2021. However, in contrast, the least number of agriculturalists joined and profited in 2020 and the maximum number of agriculturalists joined in 2016 but the maximum number of agriculturalists profited in 2017. In total 2,07,316 farmers participated during the Kharif period, out of which 1,70,341 farmers benefited. Therefore, the beneficiary ratio works out to 82.16%. on the opposite side, 5,280 farmers participated during the rabiseason, out of which 4,806 farmers benefited. Therefore, the beneficiary ratio works out to 91.02% In a nutshell, it can be said that the maximum figure of agriculturalists

profited during the Kharif period but the maximum farmers-beneficiary ratio was documented in the Rabi term. peasants' beneficiary ratio is growing year by year in the Rabi period. However, in the case of the Kharif period, the beneficiary ratio is more unstable in nature.

(ii) Sum Insured, Premium, and Paid Claims

Table 3. Claim-to-Sum Insured Ratio and Claim-to-Premium Ratio

Year	Sum Insured (in lakhs)	Premium (In Lakhs)	Paid Claims (in Lakhs)	Claim to sum insured Ratio (%)	Claim to Premium Ratio (%)
Kharif					
2016	Not implemented in the state				
2017	Not implemented in the state				
2018	Not implemented in the state				
2019	29681.55281	10239.48232	8282.569917	27.90	80.89
2020	47378.94137	12569.79197	9212.007755	19.44	73.29
2021	46763.67609	12716.8066	6516.457009	13.93	51.24
Total	**123824.2**	**35526.08**	**24011.03**	**19.39**	**67.59**
Rabi					
2016	4391.067467	2649.527401	974.1368212	22.18	36.77
2017	5665.333209	3115.024334	2893.175633	51.07	92.88
2018	Not implemented in the state				
2019	Not implemented in the state				
2020	21.59048	16.6246696	10.9624317	50.77	65.94
2021	86.1176	65.7899144	44.5980798	51.79	67.79
Total	**10164.11**	**5846.966**	**3922.873**	**38.60**	**67.09**

Source: Data Compiled from Pradhan Mantri Fasal Bima Yojana Website

The above table demonstrates the sum insured, premium, and disbursement of claims under RWBCIS from 2016 to 2021. During the kharif season, the sum insured and premium ratio decreased from 2019 to 2021. The total sum insured ratio and premium ratio are 19.39% and 67.59% respectively. However, in the case of the Rabi term, the sum insured and premium ratio, firstly, increased in 2016 and 2017. During the COVID-19 period, both the sum insured and premium ratio decreased, after

the COVID-19 pandemic period, both ratios were growing.

Overall, it can be interpreted that, the claim-to-sum insured ratio is higher in the case of the rabi season than kharif season. however, in contrast, the claim-to-premium ratio is slightly higher in the Kharif period than in the Rabi period.

8 **Testing Of Hypotheses**

It might be worthwhile to perform a couple of statistical exercises in order to validate the hypothesis, which is stated below**.**

(1) H_0: There is no growth in Loanee and Non-Loanee Farmers' participation in the RWBCIS during the Kharif Period

Table 4. Growth in Loanee and Non-Loanee Farmer's participation in the RWBCIS duringthe Kharif period

[One Sampe t test (N=4, df=3)]

Farmers	$\bar{x}$	**σ**	**'t' Value**	**'p' Value Sig.(2-tailed)**	**Decision Madewith respect tothe Null Hypothesis**
Loanee Farmers	62133.2500	42664.61908	2.912	.001**	Rejected
Non-Loanee Farmers	17997.2500	3122.32514	11.526	.062	Accepted

Source: SPSS output Note: Significant level at 1%

One sample t-test has been applied to test the growth in loanee and non-loanee farmers' participation in the RWBCIS during the kharif season. When comes to loanee farmers' participation p-value is. 0.001, The null hypothesis is rejected because the P-value is lesser than 0.05, indicating that loanee farmers' participation in RWBCIS has increased during the Kharif period, which is alsoproved by positive CAGR value 0.941 (Table-1). On the other hand, the non-loanee farmers' involvement has decreased during the Kharif period, as evidenced by the p-value of 0.062, which is greater than 0.05 and indicates that the null hypothesis is Accepted. which is also supported by negative CAGR value -0.005 (Table-1). This means that there is no growth in non-loanee farmers' involvement.

(2) H_0: There is no growth in Loanee and Non-Loanee Farmers' participation in the RWBCIS during the Rabi Period

Table 5 Growth in Loanee and Non-Loanee Farmers' Participation in the RWBCIS duringthe Rabi period. [One Sampe t test (N=5, df=4)]

Farmers	$\bar{x}$	σ	't' value	'p' value	Decision Madewith respect tothe Null Hypothesis
Loanee Farmers	643.6000	877.40287	1.633	.178	Accepted
Non-Loanee Farmers	427.8000	566.78144	1.676	.169	Accepted

Source: SPSS Output

The growth in loanee and non-loanee farmers' participation in the RWBCIS has been examinedusing a one-sample t-test. In both cases, the p-value is .178 and .169 respectively, As the p- Value is more than 0.05, the null hypothesis is accepted. It shows that neither the loanee nor non-loanee farmers' participation in the RWBCIS has increased. The result is also evidenced by negative CAGR values of -0.637& -0.447 for loanee and non-loanee farmers respectively.

(3).H_0: There is no association between seasons and farmers' who benefited from the RWBCIS.

Table 6 Number of farmers' who benefited from RWBCIS during the Kharif and Rabi seasons. [Chi-square test (N=3, df=2)]

Season	Number of farmers' benefited			Pearson chi-square value	'p'value (Significant value)	Decision made with respect to the null hypothesis
Kharif	25254	60480	84607	6.000	.199	Accepted
Rabi	23	2275	2443			

Source: SPSS Output

To investigate the association between seasons and farmers who profited from the RWBCIS, the chi-square statistic was performed. As the p-value is .199, the null hypothesis is accepted. It advocates that there is no association between the season in which farmers' joined the RWBCIS and the benefits they received from the scheme.

9 Conclusion

To preserve farmers' level of income, the Indian government has implemented a number of crop insurance programs since independence. India currently has two crop insurance programs in place: the RWBCIS and the PMFBY. From the above analysis, the researchers concluded that the mainstream of agriculturalists were enthusiastic about protecting their harvests in the Kharif term rather than the Rabi. The Rabi term beneficiary ratio was more than the Kharif term. In both seasons, the Claim-to-premium ratio was more than the claim-to-sum insured ratio. Further, the study concluded that there is no progress in farmers' involvement and no association among farmers' profited from RWBCIS.

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