

A Study on Implementation of Pradhan Mantri Fasal Bima Yojana (PMFBY) / Bangla Fasal Bima Yojana (BFBY) in Kharif 2016 Season of West Bengal

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Abstract

Pradhan Mantri Fasal Bima Yojana (PMFBY) is the new crop insurance scheme launched by Central Government in January 2016 and is being implemented in every state of India in association with the respective State Governments. As per provisions of PMFBY, premium payable by the farmers for all Kharif crops is up to 2% of the sum insured while the rest is shared equally by the Centre and State. The Govt. of West Bengal has decided to relieve the farmers from paying their own share of premium and introduced Bangla Fasal Bima Yojana (BFBY) along with PMFBY. The state is bearing its own share as well as farmers' share of premium. This study analyzed the sharing pattern of premium subsidy between Central and State for insuring notified Kharif crops viz. Aman paddy, Aus paddy, Jute & Maize and ascertained that the state govt. & central govt. share premium subsidy in a ratio of 3.08:1. It has been ascertained that farmers' coverage & area insured in Kharif 2016 season have been increased drastically in West Bengal under PMFBY/BFBY scheme. Simultaneously, increase in the actuarial premium has been witnessed at a much higher rate instead of coming down with the increasing scale of coverage. The selected insurance companies as a whole admitted a claim amount which is comparatively much lower than gross amount of premium received by them thus indicating to a profitable scenario for them. Considering all the districts of West Bengal, it has been observed that both the overall premium rate & loss cost of aman paddy is comparatively higher than all other notified crops in Kharif 2016 season. Again, it has been found that high degree of association exists between rate of premium, loss cost ratio and claims ratio of Kharif crops in different districts of West Bengal under PMFBY/BFBY.

Keywords: Crop Insurance, PMFBY, BFBY, Sum Insured, Loss Cost, Claims.

Introduction

West Bengal is predominantly an agrarian state occupying a geographical area of about 88,75,200 hectares which is only 2.7% of India's land but producing more than 8% of country's total food production. Total cultivable area of this state is about 56 lakh hectares which is 63% of its geographical area. The State is located in the humid tropic and the Bay of Bengal is close-by, it has to often face vagaries of nature like flood, cyclonic storms, land erosion, drought and other natural calamities that often adversely affect production in agriculture and financial losses to farmers.

Crop insurance is an important measure that is provided to the farmers for mitigating financial losses due to various types of natural calamities/risks which damage and destruct the production. It stabilizes income of farmers against partial or complete crop failure due to adverse weather condition or due to related adverse physical crop conditions which are beyond his control.

Various types of crop insurance schemes have been introduced in the field of Indian agriculture such as Comprehensive Crop Insurance Scheme (CCIS) in year 1985, National Agricultural Insurance Scheme (NAIS) or Rashtriya Krishi Bima Yojana (RKBJ) in 1999, Weather Based Crop Insurance Scheme (WBCIS) in 2007, Modified National Agricultural Insurance Scheme (MNAIS) in 2010 etc.

PMFBY / BFBY

Pradhan Mantri Fasal Bima Yojana (PMFBY) is the new crop insurance scheme launched by Central Government in January 2016 to replace the existing two schemes National Agricultural Insurance Scheme (NAIS) as well as Modified NAIS which had some inherent drawbacks. The scheme is being implemented in every state of India, in association with the respective State Governments. PMFBY aims at supporting sustainable production in agriculture sector by providing financial support to farmers suffering crop loss/damage arising out of unforeseen events. The scheme covers kharif, rabi crops and commercial and horticultural crops as well.

The scheme is compulsory for loanee farmers who are obtaining Seasonal Agricultural Operations (SAO) loans i.e. Crop Loans from co-operative credit institutions, regional rural banks & commercial banks or possessing a Crop Loan account / KCC account to whom credit limit is sanctioned/renewed for the notified crop during the crop season. In case if the crops they cultivate are damaged by natural calamities, farmers' ability to repay their debt is largely hampered and eventually they are bounded in debt trap. PMFBY provides a comprehensive insurance coverage against failure of the crop thus helping in stabilising the income of the farmers and ensuring repayment of loan. However, the scheme is optional for the non-loanee farmers.

The Actuarial Premium Rate is charged by insurance agencies under PMFBY. As per provisions of PMFBY, maximum premium payable by the farmers (both loanee & non-loanee) is 2 % for all Kharif crops & Oilseeds crops, 1.5 % for Rabi crops & Oilseeds crops and 5 % for Annual Commercial/Horticultural Crops. The difference between premium and the rate of Insurance charges payable by farmers is shared equally by the Centre and State. The Honourable Chief Minister, Govt. of West Bengal decided to relieve the farmers from paying their own share of premium and introduced Bangla Fasal Bima Yojana (BFBY) along with PMFBY. Now, as per BFBY, West Bengal government will bear its own share as well as farmers' share of premium payable to insurance companies while farmers of rest of India continues to bear their own share of premium to come under the purview of PMFBY. However, except premium sharing procedure as declared in BFBY, the state govt. follows all other provisions of PMFBY.

Procedure of Selection of Implementing Agency (Insurance Company) for Kharif Season

Notice is published in the widely circulated Bengali, English and Hindi daily News papers as well as in the Official Websites of the West Bengal Government inviting E-bids from insurance companies, duly empanelled in terms of para XIII of the Operational Guideline under Pradhan Mantri Fasal Bima Yojana (PMFBY) published by Department of Agriculture, Cooperation & Farmers Welfare, Government of India, for the selection of Implementing Agency (IA) to undertake implementation of PMFBY / BFBY. The tender notice for Kharif season is published every year mostly in the

month of March. The West Bengal state govt. completed the bidding process of Kharif 2016 season in April 2016.

The interested empanelled companies submit district-wise and crop-wise actuarial premium rates for all the notified crops for the entire district in a particular cluster. For more effective implementation, selection of Implementing Agency (IA) is made through adopting the cluster approach under which bunch of about 4-6 good & bad districts / areas with reference to risks is bid out. This facilitates the uniform distribution of the risks among the participating insurance companies.

The final selection of IA from the bidders is done based on the lowest weighted premium quoted by the company for all notified crops within the cluster of districts.

The insurance company quoting Lowest weighted premium rate in a particular cluster is declared as L1 and is entitled to implement PMFBY for both loanee and non-loanee farmers. If any company declines after being declared as L1, the company may be barred for the coming season and the L2 may be given the cluster for implementing the crop insurance scheme at L1 district-crop combination rates and so on to L3, L4 bidder as per the consent of insurance company.

Settlement of Claims under PMFBY

An insured crop in a notified area that recorded actual yield lower than the threshold yield (i.e., guaranteed yield) automatically becomes eligible for compensation or claims. All the insured farmers growing that crop in the defined area are deemed to have suffered shortfall in their yield. Claim is calculated using the following formula:

(Shortfall in Yield ÷ Threshold Yield) × Sum Insured for the farmer

Shortfall in Yield = Threshold Yield - Actual Yield for the defined area

Where, Threshold Yield (TY) for a crop in a notified insurance unit is the average yield of best 5 years from past seven years multiplied by applicable Indemnity Level for that crop.

Sum Insured was broadly equivalent to the 'cost of cultivation'. The sum insured per hectare for both loanee and non-loanee farmers are equal to the scale of finance as decided by the District Level Technical Committee (DLTC). The scale of finance takes into account the cost of cultivation on the basis of land quality, irrigation expenses and facility as well as cost of fertilizers, seeds and labour which varies from one district to another. For an individual farmer, the sum insured is equal to the Scale of Finance per hectare multiplied by area of the notified crop proposed by the farmer for insurance.

Three levels of Indemnity, viz., 70%, 80% and 90% corresponding to high, moderate and low risk level of the areas shall be available for all crops. The State Level Co-ordination Committee on Crop Insurance (SLCCCI) in consultation with Insurance Companies shall approve indemnity levels for notified crops and areas at sub-district or district level. In Kharif 2016 season of West Bengal, the

indemnity level was 80 % for Aman paddy & Jute while it was 90 % for Aus paddy & Maize.

Objectives of The Study

The primary objective of the study is to make a comprehensive analysis of the results on implementation of PMFBY/BFBY in Kharif 2016 season in West Bengal. Different performance parameters indicating proper implementation of the scheme and performance of the selected insurance companies engaged in providing insurance coverage to the farmers of notified crops viz. Aman paddy, Aus paddy, Jute & Maize have been analysed. In brief the objectives are:

1. To study the conceptual framework of PMFBY/BFBY scheme.
2. To review the implementation of PMFBY/BFBY in Kharif 2016 season in West Bengal.
3. To prepare crop-wise statement showing farmers coverage & area insured in respect to both loanee and non-loanee farmers, sum insured, gross premium and claim amount considering all districts of West Bengal taken together.
4. To analyse the sharing pattern of premium liability between Central and State.
5. To ascertain and analyse relevant ratios calculated on the basis of details of insurance coverage provided to Aman Paddy farmers during Kharif 2016 season.
6. To assign ranks to different districts on the basis of each ratio calculated for Aman paddy and to study the degree of association among them.

Hypothesis of The Study

To study the above objectives the following hypothesis are formulated:

1. PMFBY/BFBY scheme impacted positively on insurance coverage of Kharif crops in different districts of West Bengal.
2. High degree of association exists between rate of premium, loss cost ratio and claims ratio of Kharif crops in different districts of West Bengal under PMFBY/BFBY.

Database and Methodology

Keeping in view the objectives and hypotheses formulated for the study, data used are mostly secondary in nature. Secondary data on different performance parameters viz. farmers coverage & area insured in respect to both loanee and non-loanee farmers, sum insured, gross premium and claim amount of Kharif crops in different districts of West Bengal have been collected mostly from Notice Inviting Tender (NIT) & related documents of different years, annual reports of implementing agencies and other documents related to Kharif seasons of West Bengal.

PMFBY is the new crop insurance scheme launched by the Central Government in year 2016. Complete picture of Insurance coverage and claims related data was available from the implementing agencies (insurance companies) by the end of 2017 while the same for Kariff 2017 season will be readily available by the end of 2018. Therefore, to analyze on the basis of a complete set of data related to PMFBY/BFBY, secondary data pertaining to Kharif 2016 season only have been considered in this study.

The effectivity of PMFBY/BFBY scheme in Kharif 2016 season covering the farmers dealing in notified Kharif crops viz. Aman paddy, Aus paddy, Jute and Maize in West Bengal have been measured and compared on the basis of the abovementioned performance parameters for each notified crops considering all districts taken together. Besides, a detailed district wise picture of crop Insurance coverage provided to Aman Paddy farmers in different districts of West Bengal have been presented.

Cultivation of aman paddy is highly popular among the farmers and its volume of production is comparatively much higher than all other Kharif crops in West Bengal. Again, no. of farmers coverage, premium subsidy and claims figure are comparatively much higher than that of all other Kharif crops. Therefore, to ascertain the degree of association between rate of premium, loss cost ratio and claims ratio of Kharif crops; insurance data relating to aman paddy coverage of different districts of West Bengal has been considered in this study and Kendall's Coefficient of Concordance (*W*) has been used to measure the same as it is considered an appropriate measure of studying the degree of association among three or more set of rankings. To determine the significance of *W*, Chi-square (χ^2) test has been used.

About The Kharif Crops

'Aman' refers to the crop that is sown in the monsoons (June or July) and harvested in early winter. November is the time of the year when aman paddy is cultivated in West Bengal. West Bengal produces about 15-16 million tonnes of paddy each year across the three seasons; that include aus, aman and boro. The kharif paddy (aus and aman) output accounts for about 70 % of the total production in the State. Heavy showers of monsoons in many years flushed away paddy seeds from most of the agricultural land in south Bengal districts of Burdwan, Hooghly, Nadia, Purulia, Howrah, East Midnapore and West Midnapore. The districts of Cooch Behar, Jalpaiguri, Uttar Dinajpur and Malda in North Bengal too sometimes were amongst the worst affected.

Jute is one of the important natural fibre cash crop after cotton in terms of cultivation and usage. Almost 85 % of the world's jute cultivation is concentrated in the Ganges Delta. This region is excellent for jute cultivation as this region has fertile alluvium soil & favourable temperature along with sufficient rainfall. This geographic region is shared by both Bangladesh and India (mainly West Bengal). West Bengal alone accounts for over 50 % raw jute production. Jute is generally sown in February on lowlands and in March-May on uplands. The crop takes 8-10 months to mature but different varieties take different time to mature. The harvesting period generally starts in July and continues till October.

Maize, popularly known as 'corn' is one of the most versatile emerging cash crops. Though almost 85 % of India's maize production and 80 % of area under cultivation belongs to states other than West Bengal, maize is increasing gradually in West Bengal due to its commercial importance.

Analysis of The Study

In Table I a statement showing farmers coverage & area insured in respect to both loanee and non-loanee farmers, sum insured, gross premium and claim amount in respect to each of the four notified crops of Kharif 2016 season namely Aman Paddy, Aus Paddy, Jute and Maize respectively have been presented considering all districts of West Bengal taken together.

It is seen that majority of the farmers covered under PMFBY/BFBY scheme in Kharif 2016 season are aman paddy farmers that comprises 96.38 % of the total farmers covered under the scheme encompassing 95.09 % of the total area insured. This is comparatively high among all other Kharif crops as majority of the paddy farmers of West Bengal cultivate aman paddy in Kharif season. It has been ascertained that 54.41 % of the insured aman paddy farmers covering 62.79 % of the area insured are loanee farmers whereas non-loanee farmers comprising 45.59 % of the insured aman paddy farmers having only 37.21 % of the area insured. This indicates to a contradictory scenario in average land holding and dependency on agricultural land by loanee and non-loanee aman paddy farmers of West Bengal. The average size of insured land holding is 0.56 hectare and 0.40 hectare for each loanee and non-loanee aman paddy farmer respectively.

It can be seen that the insurance companies engaged in Kharif 2016 season for implementation of PMFBY/BFBY in all the four clusters of West Bengal failed to provide insurance coverage to the non-loanee farmers producing aus paddy, jute and maize as non-loanee farmers' coverage is zero in all the above mentioned three crops. However 6.36 % of the total loanee farmers belong to jute whereas coverage in aus paddy and maize is insignificant.

Aman paddy being the major crop of Kharif season accounts for 98.05 % (Rs. 254.73 crores) of the gross premium paid in total (Rs. 259.79 crores) for all the four crops followed by 1.92 % (Rs. 4.97 crores) of jute. On the other hand, percentage sharing of jute in total claims is less in comparison to share in gross premium.

It can be seen that farmers' coverage has been increased by 202.21 % in Kharif 2016 season over Kharif 2015 season thus resulting to an increase in sum insured by 374.69 %. This indicates that PMFBY/BFBY scheme is comparatively more effective than NAIS scheme. It is seen that total cash outlay comprising of premium subsidy, share of claim in excess of premium subsidy, bank charges borne by both the central & state govt. under NAIS in Kharif 2015 increased from Rs. 119.46 cr. to Rs. 259.79 cr. under PMFBY/BFBY in Kharif 2016 resulting an increase of 117.47 %. On the contrary, claim amount decreased from Rs. 119.67 cr. in Kharif 2015 to 108.25 cr. in Kharif 2016 resulting a decrease of 9.54 % in Kharif 2016. This implies to a conservative approach adopted by the insurers while quoting premium rate in e-tender for each notified crop in each district. Generally, decreasing trend in premium rate in relation to loss cost is witnessed with increasing scale of coverage. But in Kharif 2016, it

has been witnessed that the average premium rate is comparatively higher than average loss cost rate.

In Table II cluster wise allocation of districts, sharing pattern of premium (in percentage) between central and state govt. has been presented.

With an objective to distribute the total risk evenly, each cluster comprised of a mix of risky and safe districts were communicated along with the e-tender notification to all the prospective bidders. It can be seen that cluster 1 & 2 was allotted to Cholamandalam MS GIC Ltd. being the lowest bidder in e-tender for Kharif 2016 season whereas Future Generali India Insurance Company Ltd. and Agriculture Insurance Company of India Ltd. was allotted cluster 3 and cluster 4 respectively. The selected companies implemented PMFBY/BFBY scheme for all the notified crops for the entire district in that particular cluster.

It can be seen that premium rate for Aman paddy was highest (9 % on sum insured) in Howrah (Cluster 1) and Purba Medinipur (Cluster 4) districts while it was lowest (0.90 %) in Bankura district (Cluster 1). As per operational guidelines of PMFBY, in Kharif crops up to 2 % premium rate has to be payable by farmer and the difference between premium and the rate of Insurance charges payable by farmers will be shared equally by the Centre and State. Therefore, as per PMFBY, out of 9 % premium rate payable for aman paddy in Howrah & Purba Medinipur district 2 % was required to be borne by farmers and balance 7 % was required to be shared equally (3.50 % each) between central and state. But the Honourable Chief Minister, Govt. of West Bengal decided to relieve the farmers from paying their own share of premium and introduced Bangla Fasal Bima Yojana (BFBY) along with PMFBY. Now, as per PMFBY/BFBY the state government will bear its own share as well as farmers' share of premium payable to insurance companies. Therefore, out of 9 % premium rate payable for aman paddy in Howrah & Purba Medinipur district the Govt. of West Bengal borne 5.50 % (2 % + 3.50 %) whereas the Central Govt. borne 3.50 % only. But in case of premium rate of aman paddy in Bankura district and others districts where the premium rates were below 2 % and was payable by the farmers alone as per PMFBY, the State Govt. assumed the total liability of farmers from paying the premium.

The premium paid to implementing agencies (insurance companies) in Kharif 2016 season for all notified crops was shared between Central & State Govt. as mentioned in Table II.

In Table III a statement has been prepared showing premium paid to insurance companies and sharing of premium between Central Govt. and State Govt. under PMFBY/BFBY in Kharif 2016 season.

Considering all notified crops in all the four clusters, gross premium amounting to Rs. 259.79 crores was paid to the insurance companies. Out of the said amount, Rs. 196.15 crores was paid by the state govt. whereas central share was only Rs. 63.64 crores. It can be seen that as per PMFBY, Farmers share of premium (Rs. 132.51 crores) was much higher in comparison to State Govt.'s share and

Central Govt.'s share (Rs. 63.64 crores each). The decision of the State Govt. to assume the entire burden of premium payment of the farmers worth Rs. 132.51 crores required the farmers of West Bengal paying nothing for crop insurance. It has been

calculated that the state govt. paid 75.5 % of the gross premium liability whereas the central govt. paid only 24.5 % of the same.

Table I

Statement showing details of crop insurance coverage provided to farmers of all notified crops during Kharif 2016 season under PMFBY/BFBY in West Bengal

Sl. No.	Crop	No. of Farmers covered			Area Insured (in lakh hectare)			Sum Insured (Rs. in crores)	Gross Premium (Rs. in crores)	Total Claim amount (Rs. in crores)
		Loanee	Non-loanee	Total	Loanee	Non-loanee	Total			
1	AMAN	1602325	1342412	2944737	8.97	5.32	14.29	7374.98	254.73	107.74
		(93.56)	(100)	(96.38)	(92.41)	(100)	(95.09)	(94.42)	(98.05)	(99.53)
2	AUS	1128	0	1128	0.0063	-	0.0063	2.94	0.09	0.04
		(0.07)	-	(0.04)	(0.06)	-	(0.04)	(0.04)	(0.03)	(0.03)
3	JUTE	108963	0	108963	0.73	-	0.73	432.87	4.97	0.47
		(6.36)	-	(3.57)	(7.52)	-	(4.86)	(5.54)	(1.92)	(0.43)
4	MAIZE	182	0	182	0.00076	-	0.00076	0.39	0.0015	0.0013
		(0.01)	-	(0.01)	(0.01)	-	(0.01)	(0.005)	(0.0006)	(0.001)
Total Kharif 2016 (PMFBY/BFBY)		1712598	1342412	3055010	9.71	5.32	15.03	7811.18	259.79	108.25
Kharif 2015 (NAIS)				1010884			4.45	1645.52	119.46	119.67
Increase / (Decrease) in %				202.21			237.75	374.69	117.47	(9.54)

TABLE II

Allocation of clusters to Insurance companies and sharing of premium between Central Govt. and West Bengal State Govt. under PMFBY/BFBY during Kharif 2016 season

CLUSTER-1 Allotted to Cholamandalam MS GIC Ltd.						
Sl. No.	Districts under the Cluster	Crops	Premium Rate (%)	State Share of Premium (%)	Central Share of Premium (%)	Farmers' Share of Premium (%) borne by Govt. of WB
1	Murshidabad	Aman	1.51	0	0	1.51
		Aus	2.79	0.395	0.395	2.00
		Jute	1.23	0	0	1.23
2	Howrah	Aman	9.00	3.50	3.50	2.00
		Jute	1.00	0	0	1.00
3	Bankura	Aman	0.90	0	0	0.90
		Aus	2.92	0.46	0.46	2.00
4	Jalpaiguri including Alipurduar	Aman	4.08	1.04	1.04	2.00
		Aus	3.85	0.925	0.925	2.00
		Jute	1.50	0	0	1.50
		Maize	9.36	3.68	3.68	2.00
5	North 24 Parganas	Aman	1.64	0	0	1.64
		Aus	1.00	0	0	1.00
		Jute	1.00	0	0	1.00
CLUSTER-2 Allotted to Cholamandalam MS GIC Ltd.						
1	Paschim Medinipur	Aman	3.82	0.91	0.91	2.00
		Aus	3.55	0.775	0.775	2.00
		Jute	3.82	0.91	0.91	2.00
2	Malda	Aman	1.20	0	0	1.20
		Aus	3.50	0.75	0.75	2.00
		Jute	1.95	0	0	1.95
		Maize	1.37	0	0	1.37

3	Uttar Dinajpur	Aman	1.54	0	0	1.54
		Jute	1.31	0	0	1.31
		Maize	0.15	0	0	0.15
4	Dakshin Dinajpur	Aman	1.49	0	0	1.49
		Jute	1.62	0	0	1.62
CLUSTER-3						
Allotted to Future Generali India Insurance Company Ltd.						
1	Nadia	Aman	0.99	0	0	0.99
		Aus	2.74	0.37	0.37	2.00
		Jute	0.49	0	0	0.49
2	South 24 Parganas	Aman	1.98	0	0	1.98
		Aus	0.98	0	0	0.98
		Jute	0.78	0	0	0.78
3	Coochbehar	Aman	0.98	0	0	0.98
		Aus	0.68	0	0	0.68
		Jute	1.98	0	0	1.98
4	Birbhum	Aman	1.13	0	0	1.13
CLUSTER-4						
Allotted to Agriculture Insurance Company of India Ltd.						
1	Hooghly	Aman	5.00	1.50	1.50	2.00
		Jute	2.00	0	0	2.00
2	Purulia	Aman	5.00	1.50	1.50	2.00
		Maize	15.00	6.50	6.50	2.00
3	Burdwan	Aman	3.00	0.50	0.50	2.00
		Aus	5.00	1.50	1.50	2.00
		Jute	3.00	0.50	0.50	2.00
4	Darjeeling	Aman	2.50	0.25	0.25	2.00
		Aus	10.00	4.00	4.00	2.00
		Maize	5.00	1.50	1.50	2.00
5	Purba Medinipur	Aman	9.00	3.50	3.50	2.00
		Aus	15.00	6.50	6.50	2.00

Source: Documents of Kharif 2016 seasons, West Bengal.

In **Table IV**, statement showing farmers coverage & area insured in respect to both loanee and non-loanee farmers, sum insured, gross premium and claim amount of different districts in West Bengal of Kharif 2016 season have been presented in respect to Aman Paddy.

It can be seen that among all the districts in West Bengal, no. of farmers producing Aman Paddy covered under PMFBY/BFBY in Kharif 2016 season was highest in Purba Medinipur district (575610) followed by Paschim Medinipur (373075), Burdwan (344181), South 24 Parganas (235543), Hooghly (215739), Nadia (190253), North 24 Parganas (189127) etc. Again loanee and non-loanee farmers' coverage in Purba Medinipur district was highest among all other districts. It indicates that the implementing agency i.e. Agriculture Insurance Company of India Ltd. (AICI Ltd.) entrusted with implementing crop insurance program in Purba Medinipur district (belongs to Cluster 4) adequately emphasized their activity to insure the loanee as well as non-loanee farmers. On the other hand, it can be seen that no. of loanee farmers coverage in Paschim Medinipur district was 2nd highest among all the district in West Bengal whereas in terms of no. of non-loanee farmers coverage Paschim Medinipur district can be ranked 6th covering 101377 no. of non-loanee

farmers engaged in cultivation of Aman Paddy. The implementing agency of PMFBY/BFBY in Paschim Medinipur district (belongs to Cluster 2) i.e. Choramandalam MS GIC Ltd. was required to put adequate stress in covering non-loanee Aman Paddy farmers in Paschim Medinipur district. Similar trend can be seen in Burdwan, Bankura & Hooghly district where no. of non-loanee farmers is also much lower than that of loanee farmers. Since a loanee farmer automatically comes under the purview of PMFBY/BFBY at the time of taking agricultural loan from the state rural banks for notified crops, it is the duty of the implementing agencies (insurance companies) to fully engage its work force to approach non-loanee farmers located in remote villages farming for same crops. However, an opposite scenario can also be seen in South 24 Parganas, Nadia, Purulia and North 24 Parganas districts where no. of non-loanee Aman Paddy farmers covered were comparatively much higher than no. of loanee farmers. South 24 Parganas and Nadia district were covered by Future Generali India Insurance Company Ltd. whereas Purulia and North 24 Parganas district was covered by AICI Ltd. and Choramandalam MS GIC Ltd. respectively.

TABLE III

Statement of Premium paid to Insurance companies and sharing of premium between Central Govt. and West Bengal State Govt. under PMFBY/BFBY in Kharif 2016 season

Implementing Agency (IAs)	Farmers Covered (No.)	Gross Premium	Central Share of Premium Subsidy	State Share of Premium Subsidy	Farmers' Share of Premium	Rs. in crores
						State Govt.'s Liability (State share + Farmers' share)
AICI Ltd.	1290197	150.80	46.93	46.93	56.94	103.87
Cholamandalam MS GIC Ltd.	1087277	83.76	16.70	16.70	50.36	67.06
Future Generali India Insurance Co. Ltd.	677536	25.23	0.0079	0.0079	25.22	25.23
Total	3055010	259.79	63.64	63.64	132.51	196.15

Source: Annual reports of IAs & documents of Kharif 2016 season, West Bengal

TABLE IV

Statement showing details of Crop Insurance coverage provided to Aman Paddy farmers in different districts of West Bengal under PMFBY/BFBY during Kharif 2016 season

Sl. No.	District	No. of Farmers covered			Area Insured (in lakh hectare)			Sum Insured (Rs. in crores)	Gross Premium (Rs. in crores)	Total Claim amount (Rs. in crores)
		Loanee	Non-loanee	Total	Loanee	Non-loanee	Total	Total	Total	
1	Burdwan	236206	107975	344181	1.74	0.66	2.40	1134.05	34.02	8.65
		(14.74)	(8.04)	(11.69)	(19.39)	(12.44)	(16.80)	(15.38)	(13.36)	(8.02)
2	Purba Medinipur	307302	268308	575610	0.91	0.67	1.58	866.68	78.01	26.82
		(19.18)	(19.99)	(19.55)	(10.14)	(12.53)	(11.03)	(11.75)	(30.62)	(24.89)
3	Darjeeling	2184	599	2783	0.01	0.01	0.02	5.87	0.15	0.27
		(0.14)	(0.04)	(0.09)	(0.09)	(0.08)	(0.09)	(0.08)	(0.06)	(0.25)
4	Hooghly	157148	58591	215739	0.67	0.29	0.96	414.12	20.71	12.20
		(9.81)	(4.36)	(7.33)	(7.49)	(5.48)	(6.74)	(5.62)	(8.13)	(11.32)
5	Purulia	35298	100004	135302	0.29	0.62	0.91	313.29	15.66	1.32
		(2.2)	(7.45)	(4.59)	(3.25)	(11.50)	(6.32)	(4.25)	(6.15)	(1.23)
6	Alipurduar	9027	9484	18511	0.06	0.05	0.11	58.01	2.37	1.21
		(0.56)	(0.71)	(0.63)	(0.65)	(0.96)	(0.77)	(0.79)	(0.93)	(1.12)
7	Jalpaiguri	11813	10567	22380	0.07	0.04	0.11	57.31	2.34	0.21
		(0.74)	(0.79)	(0.76)	(0.80)	(0.68)	(0.76)	(0.78)	(0.92)	(0.20)
8	Uttar Dinajpur	28913	7283	36196	0.22	0.02	0.24	135.78	2.09	0.08
		(1.80)	(0.54)	(1.23)	(2.49)	(0.44)	(1.73)	(1.84)	(0.82)	(0.07)
9	Dakshin Dinajpur	36919	7289	44208	0.28	0.04	0.32	175.69	2.62	0.32
		(2.30)	(0.54)	(1.50)	(3.17)	(0.66)	(2.24)	(2.38)	(1.03)	(0.30)
10	Malda	31534	6830	38364	0.29	0.03	0.32	117.71	1.41	0.28
		(1.97)	(0.51)	(1.30)	(3.24)	(0.51)	(2.23)	(1.60)	(0.55)	(0.26)
11	Murshidabad	56207	65527	121734	0.37	0.27	0.65	395.47	5.97	1.37
		(3.51)	(4.88)	(4.13)	(4.17)	(5.16)	(4.54)	(5.36)	(2.34)	(1.28)

12	North 24 Parganas	67105	122022	189127	0.36	0.50	0.86	454.95	7.46	25.97
		(4.19)	(9.09)	(6.42)	(4.06)	(9.45)	(6.07)	(6.17)	(2.93)	(24.10)
13	Howrah	33472	50803	84275	0.12	0.14	0.26	198.45	17.86	5.16
		(2.09)	(3.78)	(2.86)	(1.38)	(2.66)	(1.85)	(2.69)	(7.01)	(4.79)
14	Bankura	125894	15832	141726	1.07	0.06	1.13	537.68	4.84	2.09
		(7.86)	(1.18)	(4.81)	(11.92)	(1.19)	(7.92)	(7.29)	(1.90)	(1.94)
15	Paschim Medinipur	271698	101377	373075	1.26	0.45	1.71	939.80	35.90	13.46
		(16.96)	(7.55)	(12.67)	(14.00)	(8.53)	(11.96)	(12.74)	(14.09)	(12.49)
16	Birbhum	51151	77471	128622	0.37	0.38	0.75	457.83	5.17	2.83
		(3.19)	(5.77)	(4.37)	(4.13)	(7.10)	(5.23)	(6.21)	(2.03)	(2.63)
17	Cooch Behar	33671	13437	47108	0.21	0.07	0.27	112.64	1.10	0.86
		(2.1)	(1.00)	(1.60)	(2.24)	(1.39)	(1.92)	(1.53)	(0.43)	(0.80)
18	Nadia	61945	128308	190253	0.33	0.29	0.62	276.67	2.74	0.21
		(3.87)	(9.56)	(6.46)	(3.63)	(5.44)	(4.30)	(3.75)	(1.08)	(0.20)
19	South 24 Parganas	44838	190705	235543	0.34	0.73	1.07	722.98	14.31	4.43
		(2.8)	(14.21)	(8.00)	(3.77)	(13.80)	(7.50)	(9.80)	(5.62)	(4.11)
Total		1602325	1342412	2944737	8.97	5.32	14.29	7374.98	254.73	107.74

Source: Annual reports of IAs & documents of Kharif 2016 season, West Bengal

It can be seen that in terms of farming area insured (in hectare); Burdwan district was much ahead than all other district in Kharif 2016 season with a share of 16.80 % representing 2.40 lakh hectare land out of 14.29 lakh hectare of total land insured in West Bengal for Aman Paddy. On the contrary in terms of farming area insured per farmer, it has been ascertained that on an average farmers of Malda district was having highest amount of area insured (in hectare) followed by Bankura district while farming area insured per farmer was comparatively lower in Burdwan district. The farming area insured (in hectare) per farmer in Malda, Bankura & Burdwan district was 0.83 hectare, 0.80 hectare and 0.70 hectare respectively. This indicates that aman paddy farmers of Malda and Bankura districts comparatively possess more area of land than the farmers of other districts. Earlier, it has been observed that no. of farmers producing Aman Paddy covered under PMFBY/BFBY in Kharif 2016 season was highest in Purba Medinipur district followed by Paschim Medinipur. On the contrary, it has been ascertained that area insured per farmer in Purba Medinipur district was lowest among all the districts being 0.27 hectare only while it was 0.46 hectare in Paschim Medinipur district.

Furthermore, while calculating farming area insured per loanee and non-loanee farmer individually, it has been ascertained that on an average loanee farmers possessed larger area of insured land than the non-loanee farmers in every districts except Darjeeling and Hooghly. This discrepancy is much higher in Malda, Bankura and Uttar Dinajpur district. The area insured (in hectare) per loanee and non-loanee Aman paddy farmer in Malda district was 0.92 hectare and 0.40 hectare respectively in Kharif 2016 while it was 0.85 hectare & 0.40 hectare in Bankura district and 0.77 hectare & 0.32 hectare in Uttar Dinajpur district.

In Table V, three ratios namely Gross Premium to Sum Insured ratio (GPSIR), Total Claims to Sum Insured ratio (TCSIR), Total Claims to Gross Premium ratio (TCGPR) have been presented in percentage terms in respect to each district of West

Bengal cultivating Aman paddy. All districts have been assigned with ranks as per abovementioned ratios. Again, all the individual ranks pertaining to each district have been summed up to arrive at a final rank. Finally the districts in each table have been indexed as per the sum of ranks to analyze the closeness of association among three sets of rankings that have been assigned on the basis of abovementioned three ratios. Kendall's coefficient of concordance (W) has been calculated to measure the degree of association among these three sets of rankings.

It is seen that Gross Premium to Sum Insured ratio (GPSIR) i.e. premium rate of Aman paddy in Kharif 2016 season was highest in Howrah & Purba Medinipur district (9.00 % each) while it was lowest in Bankura district (0.90 %). This wide range of premium rates quoted by the insurance companies indicates variability in yield of aman paddy among different districts due to adverse seasonal conditions in different districts and un-preventable risks like drought, flood, storm etc. that leads to crop loss. Considering premium rates of all the districts, the average premium rate calculated appears to be 3.10 % that implies to insure crop worth Rs. 100/-; Rs. 3.10/- is required to be expended as premium. Ranks have been assigned to different districts on the basis of premium rates in ascending order. In Bankura district, the quoted premium rate is lowest and has been ranked 1 as it is considered comparatively favourable because the gross premium to be borne by the government will be relatively lower among all other districts. Again, Cooch Behar district has been ranked 2 being 2nd lowest premium rate for aman paddy. In case of tied ranks, the average method of assigning ranks has been adopted i.e. each districts have been assigned the average rank that the tied observations occupy. It can be seen that premium rate of Jalpaiguri & Alipurduar (4.08 % each), Purulia & Hooghly (5.00 % each), Howrah & Purba Medinipur (9.00 % each) lead to tied ranks and have been ranked accordingly.

Similar to GPSIR; Total Claim to Sum Insured ratio (TCSIR) i.e. the loss ratio of aman paddy in different districts also varied widely ranging from

0.06 % in Uttar Dinajpur district to 5.71 % in North 24 Parganas district with an average ratio of 1.43 %. It has been calculated that on an average the insurance companies experienced a claim of Rs. 1.43/- for every sum insured of Rs. 100/- whereas they earned a premium of Rs. 3.10/- for the same. Similar profitable phenomenon has been observed in every district except only in Darjeeling and North 24 Parganas where TCSIR is much higher than GPSIR. However, this indicates to a favourable situation to the insurance companies while underwriting risks of aman paddy farmers in Kharif 2016 season in West Bengal. Further, it has also been ascertained that the ratio of Total Claims to Gross Premium Ratio (TCGPR) i.e. claims ratio of aman paddy is also satisfactory to the insurance companies. A lower TCGPR signifies the efficiency of the risk underwriting team in estimating actuarial premium rates and also a better claims management mechanism. The average TCGPR of aman paddy was 55.58 % in Kharif 2016 season that implies to earn a premium of Rs. 100/-, the insurance companies had to bear a claim of Rs. 55.58/-. Both the TCSIR and TCGPR of all the districts have been ranked in ascending order as lower ratios depicts a relatively favourable position to the insurance companies as well as to the government.

Again, in Table V the districts have been arranged on the basis of sum of ranks in ascending

order. It can be seen that all the three sets of ranks are almost in tune. The lowest sum of ranks i.e. 7 is scored by Nadia district which as per GPSIR, TCSIR & TCGPR ranked 3rd, 2nd and 2nd respectively. From financial and insurance point of view, this indicates to a relatively favourable situation to the government and the concerned insurance company (Future Generali India Insurance Company Ltd.) as a whole in providing insurance coverage under PMFBY/BFBY to aman paddy farmers in Nadia district followed by Uttar Dinajpur and Dakshin Dinajpur where the implementing agency (insurance company) was Cholamandalam MS GIC Ltd. On the other hand, Hooghly district having sum of ranks of 48.5 registered relatively adverse scenario in premium liability and claims payment as a whole followed by North 24 Parganas district with a sum of ranks of 47. All the three ratios namely GPSIR, TCSIR & TCGPR are comparatively much higher in those districts. Therefore, rankings of all the districts of West Bengal on the basis of those three ratios indicates that high degree of correlation exists between rate of premium, loss cost ratio and claims ratio under PMFBY/BFBY. Calculated value of Kendall's Coefficient of Concordance (W) i.e. 0.906 which is also statistically significant further confirms the degree of closeness of the abovementioned parameters.

Table V

Statement showing rankings of different districts of West Bengal as per three ratios calculated on the basis of details of insurance coverage provided to Aman Paddy farmers under PMFBY/BFBY during Kharif 2016 season

Sl. No.	District	GPSIR (%)	TCSIR (%)	TCGPR (%)	Rank A	Rank B	Rank C	Sum of Ranks
		A	B	C				
1	Nadia	0.99	0.08	7.77	3	2	2	7
2	Uttar Dinajpur	1.54	0.06	3.83	8	1	1	10
3	Dakshin Dinajpur	1.49	0.18	12.26	6	3	5	14
4	Malda	1.20	0.24	19.77	5	4	6	15
5	Murshidabad	1.51	0.35	23.03	7	5	7	19
6	Bankura	0.90	0.39	43.20	1	7	13	21
7	Jalpaiguri	4.08	0.37	9.04	14.5	6	4	24.5
8	Purulia	5.00	0.42	8.45	16.5	8	3	27.5
9	South 24 Parganas	1.98	0.61	30.94	10	9	10	29
10	Birbhum	1.13	0.62	54.77	4	10	15	29
11	Burdwan	3.00	0.76	25.41	12	11	8	31
12	Cooch Behar	0.98	0.77	78.32	2	12	17	31
13	Paschim Medinipur	3.82	1.43	37.48	13	13	12	38
14	Howrah	9.00	2.60	28.91	18.5	15	9	42.5
15	Alipurduar	4.08	2.08	51.07	14.5	14	14	42.5
16	Purba Medinipur	9.00	3.09	34.38	18.5	17	11	46.5
17	Darjeeling	2.50	4.51	180.39	11	18	18	47
18	North 24 Parganas	1.64	5.71	348.06	9	19	19	47
19	Hooghly	5.00	2.95	58.92	16.5	16	16	48.5
	Mean	3.10	1.43	55.58	Test Statistics N=19, Kendall's Coefficient of Concordance (W) = 0.906, Chi-square (χ^2)=34.421, d.f. 2, Asymp. Sig. 0.000			

Notes: GPSIR-Gross Premium to Sum Insured ratio, TCSIR-Total Claims to Sum Insured ratio, TCGPR-Total Claims to Gross Premium ratio.

Source: Compiled from documents of Kharif 2016 season, West Bengal & annual reports of IAs.

In Table VI, overall rankings of all notified Kharif crops of West Bengal as per three ratios (GPSIR, TCSIR & TCGPR) calculated on the basis of detailed insurance coverage in all districts of West Bengal under PMFBY/BFBY during Kharif 2016 season has been presented.

It can be seen that out of all the four Kharif crops, overall premium rate i.e. GPSIR is lowest in maize (0.39 %) while it was highest in aman paddy (3.45 %). Like GPSIR; TCSIR is also highest in aman paddy (1.46 %) thus indicating closeness of association between the two variables. The difference between GPSIR and TCSIR also indicates that average premium paid by the government to provide insurance coverage to aman paddy farmers was

much higher than average loss cost the farmers suffered in Kharif 2016 season. This trend can be witnessed in all other Kharif crops under study.

It can be seen that claims ratio of jute (9.44 %) is much lower than other three crops thus signifying to a situation favourable to the insurance companies. This indicates that out of Rs. 100/- premium received, the insurance companies on an average paid Rs. 9.44/- as claims to the farmers producing jute followed by aus paddy (Rs. 41.31/-), aman paddy (Rs. 42.30/-) and maize (Rs. 86.67/-). Therefore it can be inferred that underwriting risk of crop insurance in West Bengal is cost-effective to the insurance companies.

Table VI

Statement showing area insured per farmer and overall rankings of notified Kharif crops as per three ratios calculated on the basis of detailed insurance coverage in all districts of West Bengal under PMFBY/BFBY during Kharif 2016 season

Sl. No.	Crop	Area Insured Per Farmer (In Hectare)			GPSIR (%) A	TCSIR (%) B	TCGPR (%) C	Rank A	Rank B	Rank C	Sum Of Ranks
		Loanee	Non-Loanee	Total							
1	JUTE	0.67	-	0.67	1.15	0.11	9.44	2	1	1	4
2	MAIZE	0.42	-	0.42	0.39	0.34	86.67	1	2	4	7
3	AUS	0.56	-	0.56	2.96	1.22	41.31	3	3	2	8
4	AMAN	0.56	0.40	0.42	3.45	1.46	42.30	4	4	3	11
ALL CROP		0.57	0.40	0.49	3.33	1.39	41.67				

Source: Compiled from documents of Kharif 2016 season, West Bengal & annual reports of IAs.

Suggestions

It is evident that the number of farmers insured in West Bengal rose sharply from 10.11 lakhs in Kharif 2015 season under MNAIS to 30.55 lakhs in Kharif 2016 season under PMFBY/BFBY. With the increase in farmers' coverage, insured area has also been increased under PMFBY that lead to huge rise in sum insured. Simultaneously, this scheme has witnessed an increase in actuarial premium, instead of coming down with the increasing scale of coverage. The premium rate charged by the insurance companies seems to be high in comparison to volume of insurance coverage. Therefore, in case of necessity the government may review the possibility of introducing provision of capping of premium rates for different type of crops in the PMFBY guidelines. The scheme should serve the farmers well at a lower cost.

It is found from this study that the selected insurance companies as a whole admitted a claim amount which is comparatively much lower than gross amount of premium received by them in Kharif 2016 season thus indicating to a profitable scenario to the insurers. Individual crop wise premium payment and claim figures are also favourable to them. It can be inferred that insurance companies have made huge profits at the cost of farmers and government especially at the cost of West Bengal state government who has assumed its own premium liability as well as farmers' premium liability. Kharif 2016 was a year of normal monsoon with only 3 % shortfall at all India level. In normal rainfall years, it will be common that claim payouts are likely to remain

lower than premiums collected, while in bad years with drought/floods etc. the claims may even exceed premiums collected. Therefore it can be suggested that the government should take adequate measures to instil more competition among the participating insurance companies in e-tender process so as to reduce the rate of premium. The state governments may also evaluate the possibility of incorporating a state owned company for crop insurance which may compete with the private companies and ultimately that may result in reduction of premium rate. However, it is expected that competition among the existing companies in the upcoming seasons will reduce the premium rate and eventually it will reduce cost to the government.

To receive low actuarial premium rates it can be suggested that state governments will float their tender on time and complete the tender process within the original cut-off date of 31st July as mentioned in the operational guidelines of the scheme. Delay in bidding process may provoke the participating companies to quote high premium rate as on that case the rainfall / flood situation of the season will be already known to them. Moreover, the reinsurance companies will also quote high reinsurance rates.

The state government is responsible for providing yield data of Crop Cutting Experiments (CCEs) to insurance companies and claims are settled on the basis of actual yield comparing it with the threshold yield. Adequate measures should be taken to increase the no. of CCEs in the village

panchayat level. Use of mobile based technology with GPS stamping as stated in operational guidelines of PMFBY may be ensured to improve the quality of CCE data i.e. to prevent data manipulations and faster assessment of claims.

On receipt of yield data, insurance companies are required to settle the claims. But companies sometimes delay in paying off the claims to farmers and they mention delay in receiving premium subsidy from the state government. It can be suggested that both the central & state government may take adequate measures to release their own share of premium subsidy in time to enable the insurance companies in speedy claims settlement. This will create excitement among the farmers about the scheme which may attract more farmers under the purview of crop insurance. Simultaneously, the authority may include a provision in the PMFBY guidelines to debar an insurance company from participating in future bidding process for non payment of claims to the farmers.

It is generally said that farmers have little knowledge on different aspects of PMFBY/BFBY scheme viz. implementing agency, sum insured, premium rates, procedure of claim settlement etc. There is need to create awareness among farmers through government agencies, insurance companies and banks. Adequate publicity is to be given in all villages of the notified districts through fairs, exhibitions, SMS, short films, electronic & print media and documentaries.

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