Technical Note

For

"Pradhan Mantri Fasal Bima Yojana (PMFBY) – Rajasthan"

Name of Insurer	Kshema General Insurance Limited
Line of Business	Crop Insurance (Miscellaneous)
Product	PMFBY – Rajasthan
Name of the Appointed Actuary	Piyush Jain
Version Number	1.0
Date	04th July 2023

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Section 1. General Information

SI. No.	Description	Details
1.01	Brand name of Product	PMFBY
1.02	New or Modification of existing Product	New
1.03	Period of Policy	3 years
1.04	Category of Product	Indemnity Policy
1.05	Type of policy	Group Pricing with Individual Enrolment
1.06	Target Group	Farmers
1.07	Is the Product Reinsurance driven?	No
1.08	Add-ons that will be sold alongside:	**Mandatory** – Prevented Sowing, Post Harvest Loss
1.09	Crops Covered	**Kharif** – Black Gram (Urad), Cotton (Kapas), Green Gram (Moong), Groundnut (Pea Nut), Guar, Maize (Makka), Moth Bean (Kidney Bean/ Deww Gram), Paddy (Dhan), Pearl Millet (Bajra), Sesame (Gingelly/Til)/Sesamum, Sorghum (Jowar/Great Millet), Soybean (Bhat) **Rabi** – Barley (Jau), Bengal Gram (Chana), Lentil (Masur), Mustard, Rocket Salad (Taramira), Wheat

Section 2. Summary of Benefit Structure

For the base cover, reimbursement will be based on crop yield as follows:

*Sum Insured * (Threshold Yield (TY) – Actual Yield (AY))/TY*

For Add-on covers, please refer PMFBY Operational Guidelines for details of benefit structure.

Section 3. Data used

3.1 Source of Data

11-year yield data by Crop, District, Block and Insurance Unit received as part of the tender has been used for pricing purpose.

3.2 Data Checks, Adjustments and experience

The yield data has been received from the government and has been assumed to be accurate and correct. Any issues or anomalies identified as part of the analysis were submitted as queries to the tendering authority for response or corrections.

Any blanks for yield are ignored and prior years are considered for Threshold Yield calculation. For estimation of claims cost and pricing, the actual yield for that year is assumed to be the average yield for the IU for the years in which the yield is present.

Section 4. Assumptions and Methodology

i) Burning cost model has been used where historical claim cost has been simulated using the TY (provided as part of the tender) and AY for 2012 to 2022 using the formula:

$$\text{Max}(0, (TY - AY) / TY)$$

ii) The above calculation is done for each crop at Insurance Units level. This is then aggregated to district level assuming same exposure in each Insurance Unit within a district.

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iii) A simple average of the 6 years' claim cost (2016 to 2021) as modelled above is taken as the expected claim cost.

iv) 2022 is considered an outlier year with very low yield and has been excluded from the estimates of claim cost.

v) Add-on perils are assumed to have an immaterial impact on pricing and no loading has been added to the rates for these.

Section 5. Gross Premiums

i) The overall gross premium for the entire contract was 7.58% of sum insured as per the expected area insured shared as part of the tender. The following loadings were added:
   - Expected Loss Ratio – 79.36%
   - Bank Charges & Commission – 0.88% of Gross Premium (4% of the Farmer share)
   - Marketing Expenses – 0.5% of Gross Premium (minimum mandatory charges)
   - Management Overheads – 3% of Gross Premium
   - Cost of Reinsurance – 14.52% (assuming 80% quota share with 2.5% reinsurance commission)
   - Profit Margin – 1.75%
   - Investment Income – Nil investment income has been assumed.

ii) The Gross Premium rates as a proportion of the sum insured will remain fixed over a period of 3 years. Further, no underwriter or other discretion is allowed in the rates.

Section 6. Rating Factors

i) The tender requires premium rates by district and crop. These rates will then be applied to area and sum insured.

ii) Based on limitations of the tender, the rates have been calculated by district and crop and no additional rating factors have been modelled.

Section 7. Discounts/loadings/Cancellation & Terminations

Not Applicable

Section 8. Business Projections

Amount in Rs. Crores

Item	Financial Year 1	Financial Year 2	Financial Year 3
Gross Written Premium	386.53	386.53	386.53
Expected Ultimate Loss ratio (inclusive of IBNR)(Gross)	79.36%	79.36%	79.36%
Profit margin	1.75%	1.75%	1.75%
RSM	46.01	46.01	46.01
Capital Required for this product at 150% of RSM	69.01	69.01	69.01

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Based on the IRDAI (ALSM of General Insurance Business) Regulations 2022, as on the date of writing this note, the capital requirement for the annual expected premium for the contracts won is Rs. 115.5 Crore. The company is in the process of raising more capital and assurance has been obtained from the promoter that the required capital will be raised based on the requirements as per the actual written premium.

Section 9. Profit test, Sensitivity/Scenario test (using last year's area insured)

i) The data and assumptions used for the calculation of Pure Risk Premium are volatile and the actual experience can vary from the expected experience. Every 1% change in the loss ratio will lead to c.0.2% change in the profit margin.

ii) The company is in the process of procuring the reinsurance treaty and the reinsurance cost and retention rates are as per the latest expectations based on discussions till the timing of this note.

iii) It has been assumed that 80% quota share will be obtained by the company, with the reinsurer paying a 2.5% commission of the premium ceded to Kshema General Insurance.

iv) Every 10% increase in retention by the company (from the current 80%) will lead to a 1.81% increase in the profit margin in the base scenario. However, this will lead to higher exposure for the company to any adverse claims experience covered by this policy.

v) Any change in commission, marketing expenses or management overheads will directly impact on the profit margins of the company.

Please note that all movements and impacts quoted above are in percentage points (i.e. as a proportion of premium) and not as a proportion of the metric mentioned.

Section 10. Reserves

Following Reserves are planned to be maintained by the company:

i) Unearned Premium Reserves (UPR) – Using the 365th method.
ii) Additional Unexpired Risk Reserves (AURR) – If required based on updated view of all assumptions by the company.
iii) Outstanding Case Reserves (OCR) – As per the assessment by the claims department.
iv) Incurred but not reported (IBNR) – Standard Actuarial Techniques of Expected Loss Ratio Method, Bornheutter-Ferguson method, chain ladder method etc. will be used for projection of IBNR.

Section 11. Premium tables / rate chart

Refer the attachment to this note.

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Annexure – 2

I, Piyush Jain, the Appointed Actuary, certify that, in my opinion, the premium rates, advantages, terms and conditions of the above product/add-on are workable and sound, the assumptions are reasonable and premium rates are fair.

The rates, terms and conditions of the above-mentioned product are determined on a technically sound basis and are sustainable on the basis of the information and claims experience available.

I further certify that the premium is adequate to cover the claims cost. Also, where the premium is not deemed adequate, there will be a premium deficiency reserve, which is provisioned separately.

Signature of the
Appointed Actuary

Countersigned by:

Signature of CEO

Signature of PMC

Place: Hyderabad

Date: 4th July 2023