Technical Note

For

"Pradhan Mantri Fasal Bima Yojana (PMFBY) – Himachal Pradesh"

Name of Insurer	Kshema General Insurance Limited
Line of Business	Crop Insurance (Miscellaneous)
Product	PMFBY – Himachal Pradesh
Name of the Appointed Actuary	Piyush Jain
Version Number	1.0
Date	08th June 2023

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Section 1. General Information

Sl. 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, Mid-Season Adversity, Post Harvest Losses, Localized Risks
1.09	Crops Covered	Kharif – Maize, Paddy Rabi – Wheat (all districts), Barley (Chamba and Kangra)

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

10-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.

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 2016 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.

iii) A simple average of the last 3 years' claim cost as modelled above is taken as the expected claim cost. The premium rate has been calculated using the claim cost and a target loss ratio of 80%. A floor of 2% of sum insured has been applied on the premium rate by crop and district.

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

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Section 5. Gross Premiums

i) The overall gross premium for the entire contract was 6.80% of sum insured as per the expected area insured shared as part of the tender. The following loadings were added:
   - Expected Loss Ratio – 80.00%
   - Bank Charges & Commission – 0.72% 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 – 13.71% (assuming 80% quota share with 2.5% reinsurance commission)
   - Profit Margin – 1.71%
   - 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.

iii) The above values are based on the expected area insured provided as part of the tender. However, this is considered ambitious by the company and last year's area insured would be deemed a more realistic estimate of the business volume.

iv) Based on last year's area insured, the gross premium will be 12.76% of sum insured. The remaining estimates will be as under:
   - Expected Loss Ratio – 79.46%
   - Bank Charges & Commission – 1.03% 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 – 14.43% (assuming 80% quota share with 2.5% reinsurance commission)
   - Profit Margin – 1.58%
   - Investment Income – Nil investment income has been assumed.

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

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Section 8. Business Projections

Amount in Rs. Crores

Item	Financial Year 1	Financial Year 2	Financial Year 3
Gross Written Premium	22.85	22.85	22.85
Expected Ultimate Loss ratio (inclusive of IBNR)(Gross)	79.46%	79.46%	79.46%
Profit margin	1.58%	1.58%	1.58%
RSM	2.72	2.72	2.72
Capital Required for this product at 150% of RSM	4.09	4.09	4.09

The company has enough capital available to support the written business and there is no risk to solvency position based on the IRDAI (ALSM of General Insurance Business) Regulations 2022.

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 1.80% 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.

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Section 11. Premium tables / rate chart

Name of the Districts	Crops notified to be covered in a Cluster	Premium Rates quoted by Company (%)
Chamba	Maize	15.00%
	Paddy	12.91%
	Wheat	11.98%
	Barley	8.66%
Hamirpur	Maize	5.01%
	Paddy	2.00%
	Wheat	8.40%
Kangra	Maize	6.79%
	Paddy	2.00%
	Wheat	7.88%
	Barley	5.63%
Una	Maize	7.14%
	Paddy	6.36%
	Wheat	6.28%

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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: 8th June 2023