Technical Note
For
"Kshema Prakriti"

Name of Insurer	: Kshema General Insurance Limited
Line of Business	: Crop Insurance
Product	: Kshema Prakriti
Name of the Appointed Actuary	: Piyush Jain
Version	: 5.0
Date	: 15th September 2023

Section 1. General Information

This note is only applicable to the policies sold during the enrolment window, as declared by Kshema General Insurance Limited, for Kharif 2023 season. A separate note needs to be obtained for pricing and sale of this product outside the enrolment window.

Below are the details of the product:

SI.No.	Description	Details
1.1	Brand name of Product	Kshema Prakriti
1.2	New or Modification of existing Product/ Add-on	Modification – Rate Changes
1.3	Perils Covered	1. Drought 2. Hailstorm 3. Cyclone 4. Flood 5. Fire excluding forest fire and bush fire 6. Aircraft Damage 7. Landslide 8. Inundation 9. Earthquake
1.4	Category of Product	Indemnity Policy
1.5	Type of policy	Individual
1.6	Target Group	Farmers
1.7	Is the Product Reinsurance driven?	No
1.8	Add-ons that will be sold alongside:	None

Section 2. Summary of Benefit Structure

2.1 Benefit Description

In the event of an insured event, resulting in a damage to the insured crop, the policyholder will be able to claim an amount equivalent to the following:

*Sum Insured * Proportion of area affected * Compensation Percentage*

Proportion of area affected shall be as determined by the company through satellite image/ pictures obtained through app / drone images / physical inspection.
Compensation Percentage is based on the time elapsed from the date of sowing, as a proportion of the duration of the crop, and has been defined in the policy wordings. Compensation Percentage can range from 15% to 100%.

2.2 Other Details

- **Policy Term:** Variable, as selected by the Policyholder during purchase of the policy
- **Enrolment Window:** The policies can only be purchased by the farmers during the enrolment window for the particular crop season, as declared by the company.

Section 3. Data used

3.1 Source of Data

Being a new insurance company with no internal claims data is available for pricing. No industry data is available from IIB on Crop Insurance as on the date of writing this technical note. Further, given the unique structure of benefits for this products, no publicly available industry data of existing crop insurance products is considered relevant for the pricing of this product.

Data from India Meteorological Department (IMD) has been used for pricing of this product as follows:

- Drought: IMD New High Spatial Resolution (0.25X0.25 degree) Daily Gridded Rainfall Data Set Over India has been used for modelling of drought risk. This provides daily rainfall in millimeter (mm) by longitude and latitudes.
  Website Link: https://www.imdpune.gov.in/lrfindex.php
- Hailstorm, Cyclone and Floods: Hazard data from IMD has been used.
  Website Link: https://imdpune.gov.in/hazardatlas/index.html

No data on impact of other perils on crops is available. As per the expert judgement of the PMC members, these occurrences of these perils which impact the crops being insured is rare. Further, even in case of occurrence of one of the peril event, the impact is expected to be limited to individual farms or a few farms. Considering the low expected frequency and severity of these perils, the PMC has decided to include these perils in the policy for a premium as defined in the assumptions.

As the company generates internal data on policies and claims and as new sources of data suitable for pricing of this product are identified, this technical note may be revised and the updated pricing will be presented to the PMC for approval and implementation.

3.2 Data Checks, Adjustments and experience

Complete reliance has been made on the completeness, accuracy and quality of the data sources since they are being sourced from a department of Government of India.

In the absence of any internal data or industry data for products with comparable benefit structure, no comparison of the data sources against these data sources is possible at this stage.

Section 4. Assumptions and Methodology

i) While no reliable crop insurance loss data exists for the following perils, these are considered to be very low frequency and severity perils. A nominal pure risk premium of 0.5% of Sum Insured will be charged for these perils as the pure risk premium. Loadings / Discounts as applicable to the pure risk premium will apply to this. As the company generates internal data for these perils, this pure risk premium rate will be refined in the next version of the technical note.
The perils covered by this point are Cyclone, Fire excluding forest fire and bush fire, Aircraft Damage, Landslide, Earthquake, Inundation (excluding due to other covered perils).

ii) Frequency-Severity method will be used for modelling of the remaining perils, based on non-availability of data for any other models. The Compensation Percentage based on the expected start date of policy and the date of loss has been factored into the policy.

iii) In the event of a Hailstorm event in a district as per IMD, the entire district is assumed to be affected by the peril.

iv) Given that floods are mainly caused by excessive rainfall during monsoon season, all floods as per the IMD data are assumed to occur uniformly over the months of June to September.

v) The frequency of floods is calculated as:
*Annual average number of floods * Cover Period Days in June - September period / 122*

vi) In the event of a flood in a district, 19.25% of the area is assumed to be affected. This is based on the average annual area impacted by floods in India as a proportion of Flood Prone Area in India. The data is based on the following source: https://ndma.gov.in/Natural-Hazards/Floods.

vii) Drought is modelled using the rainfall data from IMD for the nearest 0.25x0.25 Grid point for which the data is available.

viii) All perils are assumed to be independent of each other and it is assumed that multiple perils can impact an area during one cropping season.

ix) Risk Premium has been capped at 15% for a peril and 24% for the policy.

x) The Base premium has been calculated for a 100-day policy starting on 1st June. For different cover periods, premiums will be scaled proportionally.

Section 5. Gross Premiums

i) The company will target an Expected Loss Ratio of 60% and the Gross Premium has been calculated accordingly.

ii) Other Loadings and Discount Factors are as follows:
   - Commission Ratio: 10%
   - Management Overheads: 20%
   - Investment Income: -0.9%
   - Cost of Reinsurance: 9.6%
   - Profit Margin: 1.3%

iii) Commission Ratio – A 10% average commission ratio has been assumed.

iv) Investment Income is calculated using a 6% rate of return on claims and premium reserves. Claims are assumed to be paid 0.2 years from the date of loss event. This is based on the 2023Q3 NL39 disclosures of AIC which also primarily handles Crop Insurance claims. Considering the company's ambition to settle claims instantaneously, lower ends of the bands disclosed in NL39 have been taken for this calculation.

v) Management Overheads and Cost of Reinsurance: These are as per the Business Plan of the company.

xi) Gross Actuarial Premium (Office Premium) will be calculated by dividing the pure risk premium by the expected loss ratio. This will then be rounded off to the nearest rupee.

xii) GST and other applicable taxes (if any) will be added to the above premium.

Section 6. Rating Factors

i) *Geographical Location*: The Latitude and Longitude of the insured farm will be used to ascertain its geographical location. This is used as a rating factor considering the high variation in the incidence of the insured perils based on the geographical location of the risk.

ii) *Coverage Period (Duration)*: Given the dependence of the sowing date on climatic factors and the uncertain nature of the harvesting date for any farmer, this policy provides an option to the policyholder to select the coverage period he/she wants to be insured for. The base premium has been calculated for a 100 day policy. The Gross Premium will be proportionally increased/reduced based on the coverage period opted by the policyholder.

Section 7. Underwriting Considerations

i) The underwriting department of the company will have the authority to apply loadings or discount to the office premium based on his/her assessment of the risk. Basis of this underwriting may include:
   - Coverage Period (factors other than duration)
   - Crop Insured
   - Irrigated/Rainfed Farm
   - Loss mitigation measures by the farmer

ii) These loadings/discounts will be capped at +/- 25% of the office premium.

Section 8. Solvency Considerations

The company has an available capital of over Rs. 100 crores and the planned premium for the 1st year of business is Rs 106 Cr. Further, there are plans to raise further capital in the company. The risk of the solvency ratio of the company falling below the requirements as per IRDAI (Assets, Liabilities and Solvency Margin of General Insurance Business) Regulations is immaterial.

Section 9. Profit test, Sensitivity/Scenario test

i) Given the non-availability of internal and industry data, the assumptions used for the calculation of Pure Risk Premium are highly subjective and based on the judgement of the Actuary and the PMC members. Every 1% change on the loss ratio will lead to c.0.75% change in the profit margin.

ii) A 2% or more adverse loss ratio than expected would lead to negative profit margins for the company.

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

iv) It has been assumed that the reinsurer will retain 30% of the *reinsurance premium less reinsurance claims* while the remaining will be paid back to the company as reinsurance commission. Assuming the 80% cession and 60% Expected Loss Ratio, 1% change in the reinsurance cost will lead to a 0.32% change in the profit margin.

v) Every 1% increase in retention by the company (from the current 80%) will lead to a 0.13% increase in the profit margin in the base scenario. However, this will lead to higher exposure for the company to any adverse climatic events covered by this policy.

vi) Any change in commission rates or management overheads assumption will directly impact the profit margins of the company.

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

The premium rates for a 100-day policy by district names are attached as an excel file to this Pricing note. These rates are exclusive of GST and any other statutory taxes.

Section 12. Any Other Details

The company has divided the country into different grids, each with a unique ID. This pricing note is applicable only to the Grid IDs falling within the mentioned districts.

Annexure – 2

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

If actual experience turns contrary to the assumptions and projections, corrective action will be taken to ensure that the ultimate loss ratio does not exceed the loss ratio assumed in the pricing.

I further certify that the premium is adequate to cover the claims cost. Also, where the premium is not adequate, there will be a premium deficiency reserve, which will be provisioned separately. It is planned to review the rates, terms and conditions of cover based on emerging experience.

It is further certified that the underwriting of the product now filed shall be within the Board approved underwriting policy of the Company.

Signature of the
Appointed Actuary

Countersigned by:

Signature of CEO

Signature of PMC

Place: Hyderabad

Date: 15.09.2023