INDIA FELLOWSHIP SEMINAR
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Issues with pricing and reserving of Crop Insurance, challenges in meeting increasing demands of agro insurance

Group 10

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- Overview of crop insurance and its evolution in India
- Issues related to pricing of crop insurance
- Issues related to reserving for crop insurance
- Challenges in meeting increasing demand

Overview of crop insurance and its evolution in India

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Agriculture in India

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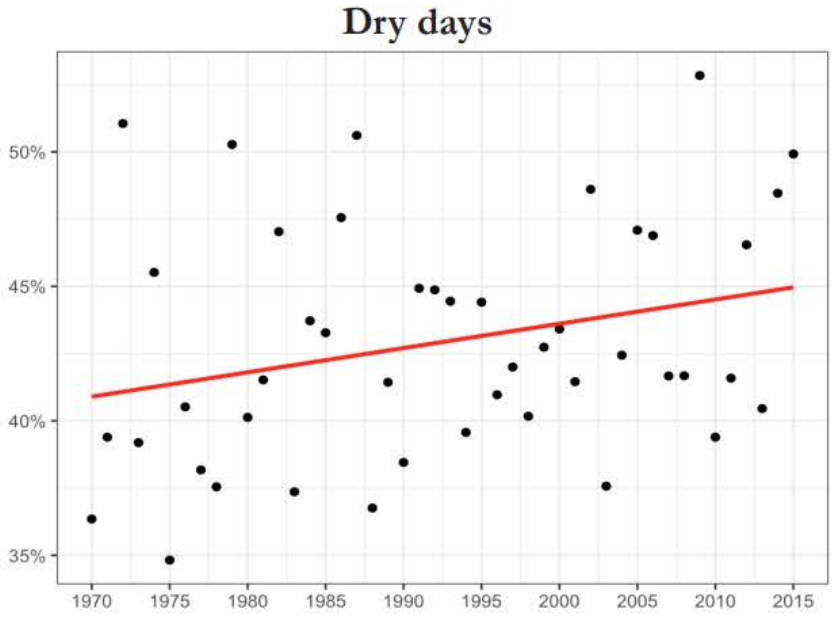
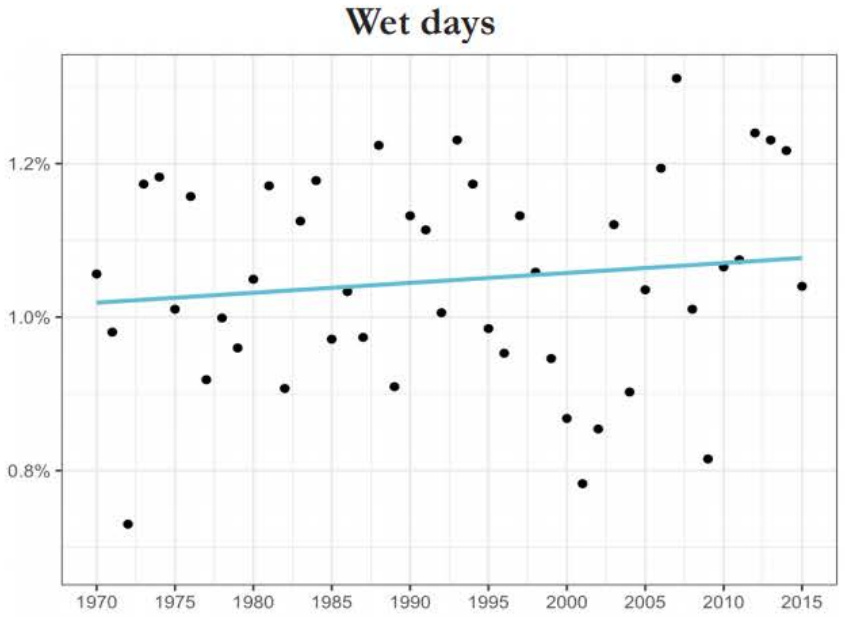
16%	Employs 49%	52%
Of GDP		Un-irrigated

Source: Economic Survey 2017-18

Agriculture in India

Figure 7. Dry and Wet Days during the Monsoon
(percentage of total days)





Source: Survey calculations from IMD data.

Source: Economic Survey 2017-18

Crop Insurance – An overview

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- What is crop insurance?
- Insurance that protects the insured (farmer) against loss or damage to crops from a variety of perils, including but not limited to fire, lightening, loss of revenue, tornado, windstorm, hail, flood, rain, or damage by insects

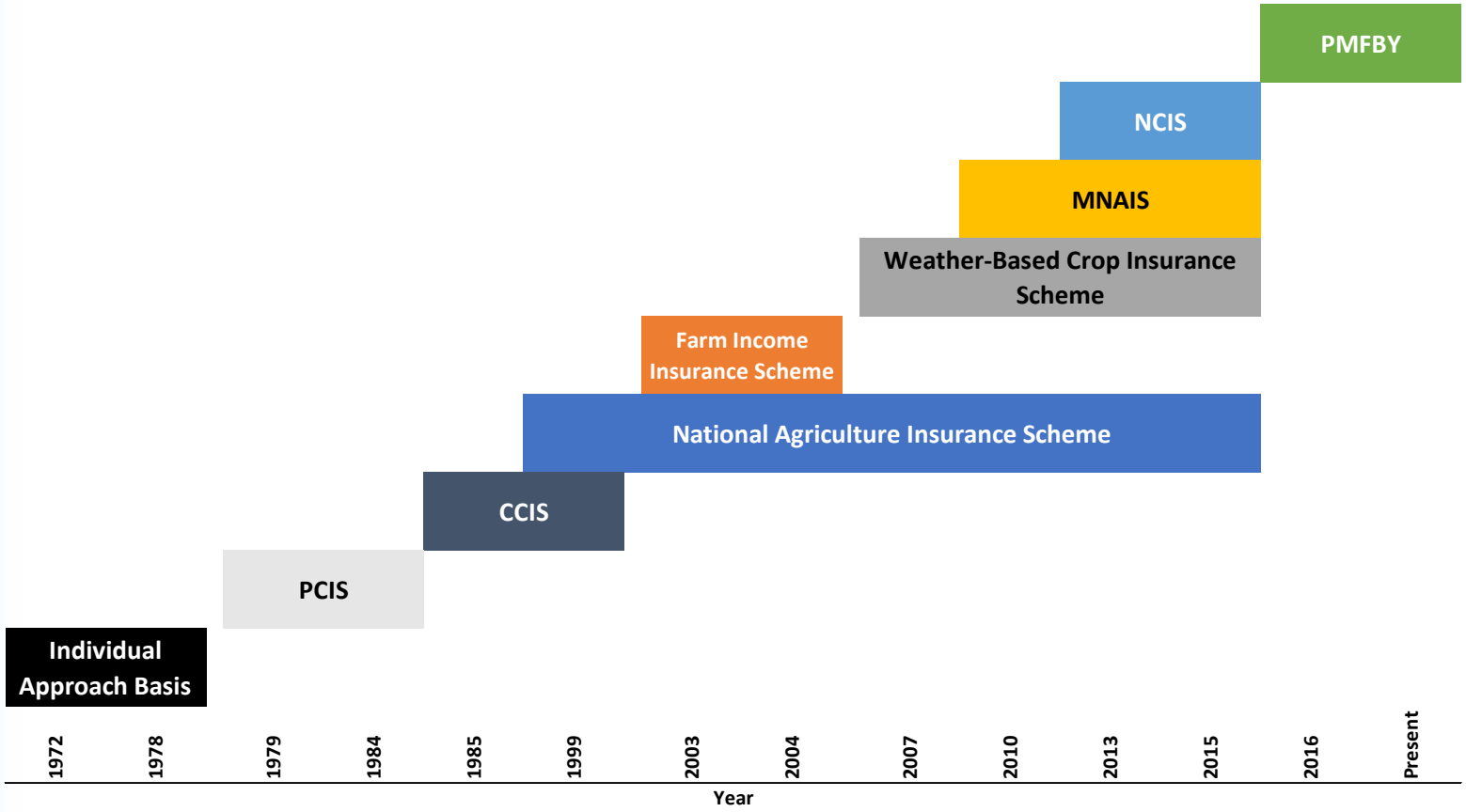
» Source: NAIC glossary

Crop Insurance – History in India

- The concept emerged early in the 20th century
- Pre-independence
  - Rain insurance scheme in Mysore, 1915
  - Proposed by J. S. Chakravarthi
  - Little success

» Source: AIC

Crop Insurance – History in India



Source: IAI / GIC / AIC

Crop Insurance – PMFBY

- Pradhan Mantri Fasal Bima Yojana
  - Actuarial Premium Rates charged
  - Maximum insurance charges for farmer
    - 1.5%-5% of sum insured depending on season, crop
  - Difference with premium rate paid by centre, state

Crop Insurance – PMFBY

- Pradhan Mantri Fasal Bima Yojana
  - Govt support when claims exceed thresholds
    - 350% of premiums and 35% of TSI at national level
  - Implementation by empaneled insurers
  - Use of mobile technology to improve yield data

» Source: Govt of India

Crop Insurance – In the news

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May 12, 2018 11:01 AM IST | Source: Moneycontrol.com

Crop insurance: Foreign reinsurers need to step in

Even as the government is planning to increase the coverage to 50 percent of crop area in FY19, reinsurance support could see a dip

THE HINDU BusinessLine

Lack of data is a challenge for crop risk insurance: Lloyd's of London

THIRUVANANTHAPURAM, MAY 9

PM's crop insurance plan gets hi-tech helping hand, app to assess crop loss

For a transparent estimation of crop losses, the agriculture ministry has developed an android app and harnessed satellite technologies, such as remote sensing.

INDIA Updated: May 05, 2018 23:06 IST

Zia Haq
Hindustan Times, New Delhi

Issues related to pricing of crop insurance

Challenges in Pricing (1)

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- Reliability of the past data for projecting the future ?
  - Yield data is shared by the respective State Governments
  - Extent of availability- Minimum requirement of 10 years for better trend analysis
  - Granular level
  - Data Gaps/missing data points
  - Completeness and Accuracy of data available
  - Data used for pricing would be at the same level as the Claims settlement level
  - Reliability and validation of yields from CCE and Weather stations

Challenges in Pricing (2)

- Basis risk
  - Arises mainly in case of Missing data
  - Actual yield data at gram panchayat level may varies with block level data
  - Use of Block level data for missing gram panchayat increases uncertainty

- Detrending
  - Optional and subjective
  - Various approaches not encouraged if data series

Challenges in Pricing (3)

- Indemnity Level
  - Specified in the tender document
  - High risk may be priced in low risk
- Pricing models
  - Lack of credible and reliable models
  - GIC Re/Swiss Re notes

Challenges in Loading (1)

- **Loadings**
  - Volatility/Data Uncertainty : Minimum loading of 10%-15%
  - Nat Cat events: Minimum loading of 5% to 10%
  - Heterogeneity/ Basis Risk Factor :
    - If data is only at Tehsil or Equivalent level then minimum loading of 15%- 20%
    - If data is only at District level then minimum loading of 25%-30

Challenges in Loading (2)

- Prevented/ Failed Sowing risk
- Localized Calamities/ Midterm Adversity/ Post-harvest losses
- Gaps in actual and expected sum insured
- discounting or loading for other factor:
  - Recent year's claims experience of the risk involved
  - Weather Forecast

Further considerations

- Moral hazard and adverse selection
- Crop Cutting Experiments limitations
- Lack of persistency / renewal of business as it is yearly tender driven

Summary

- Different from General Insurance wherein all checks can be done during acceptance.
- Only consolidated details furnished such as notified crop, notified area & year wise yield which are difficult to verify.
- Weather related prediction so prudent to seek specialists opinion
- Information About Topography (Coastal / Hilly)
- IA is required to be made through cluster approach (bunch of about 15-20 good & bad districts / areas) for uniform distribution of the risks and which will avoid selection of districts / areas according to company's choice.
- Uneven spread of risk. Huge numbers from High risk areas and vice versa. Resulting in high claim ratio.

Key Messages from APS 21 : Appointed Actuary and General Insurance Business

- Ensure that the general insurance business of the company is conducted on sound financial lines
- IBNR reserves and the premium rates as stipulated in the regulation
- premium rates for new business or renewal of existing business are fair
- data are accurate, reliable and consistent.
- review the reinsurance arrangements from time to time

Issues related to reserving for crop insurance

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Nature of Crop Business

- Short tailed business – begins & ends with the crop season viz Kharif season and Rabi season
- There is no attritional claims development
- It is heterogeneous in nature – State covered and crop insured
- Impact of natural CAT events can be significant
- Claims experience usually very volatile

Methodology

- Applicable in the Indian context
  - » Chain Ladder Method
  - » Bornhuetter Ferguson
  - » Ultimate Loss Ratio ✓

Ultimate Loss Ratio

- At the basic level, can be the pricing loss ratio assumed; including any contingency margin
- Estimates are possible for season and crop
- Estimates possible from weather reports, on the ground assessors, any other relevant reports
- Incorporates the latest information including any natural CAT events like floods, hail etc

Ultimate Loss Ratio

- Easy to implement and communicate

On the flip side

- Usually is a subjective estimate; lack of quality data compounds the situation

- Difficult to reach a common estimate between the Actuarial and Finance/Other functions

Issues with Data

- Delays in Premium Information & Recognition
- Collating of Data – can be manual and leading to not so insignificant human errors
- Requisite Crop Cutting Experiments (CCE) may not happen
- Delays in conducting the CCEs
- CCE outcomes are not always reliable – '*on ground influence*' on the outcomes

Reserving - Conclusion

- Reserving for Crop is unlike reserving for other lines of business; highly volatile experience
- Clear Patterns are yet to emerge; with more data being captured estimates may improve
- Weather is Weather – highly unpredictable!

Challenges to meet increasing demand

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Issues and challenges – Agricultural Insurance

1. State-level policy
2. Issues with premium
3. Man power capacity of insurance companies
4. Assessment of crop loss – issues
5. Inadequate and delayed claim payment to farmers
6. Revenue based insurance

Reference: PRADHAN MANTRI FASAL BIMA YOJANA AN ASSESSMENT – by Centre for Science and Environment

1. State-level policy

- Delayed notification:
  - One month
  - Notification after sowing
  - Prevented sowing claims

1. State-level policy

- Threshold yield:

  - Notification for every IU
  - Most states have not mentioned
  - Except certain states like Haryana
  - Unclear process and settlement

1. State-level policy

- Threshold yield:

"In Haryana—where threshold yield has been notified—farmers showed CSE researchers that the yield numbers in the state notification is significantly lower than the actual yield for many crops"

1. State-level policy

- **Sum insured lower than scale of finance:**
  - Insurance not valuable to farmers

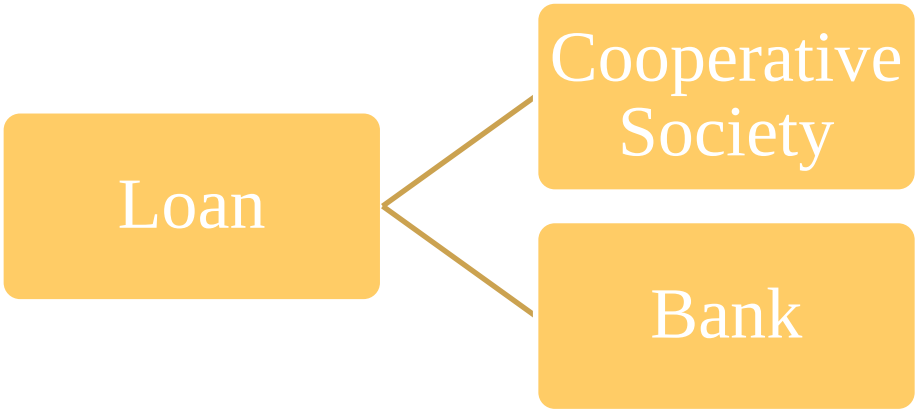
"In Beed district of Maharashtra, the cost of cultivation for moong in 2015-16 given in the Maharashtra State Agriculture Price Commission was Rs 34,147 per ha. However Maharashtra State Kharif 2016 notification of PMFBY kept the value of sum insured at just Rs 18,000 per ha—about 53 per cent of the cost of production."

1.State-level policy

- Notified major crops – Not comprehensive
- State government subsidy
- Sharecropper and tenant farmers
- Mixed cropping & crop diversification
- Poor awareness

2. Issues with premium

- Non-notified crops



- **AADHAR** has been made mandatory

3. Man power capacity of Insurance companies

- No functional office in tehsils
- No agents at block level
- Leverage on banks to increase sales
- Non Loanee sales

Claims settlement and grievance redressal

Farmers not provided policy documents.

No direct linkage with insurance companies

4. Issues in Assessment of crop loss

- Number of crop-cutting experiments
- False crop-cutting experiments
- Lack of trained outsourced agencies
- Political overtones
- Innovative technology usage

5. Inadequate and delayed claim payment to farmers

- Non-payment for localized calamity
- Huge delay in payment of claims
- Prevented Sowing
- Individual farm level claims

6. Revenue based insurance

- PMFBY covers only cost and not loss in revenue to the insured
- How to decide revenue
- MSP ?
- Markup over scale of Finance ?

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Questions ?

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Thank you