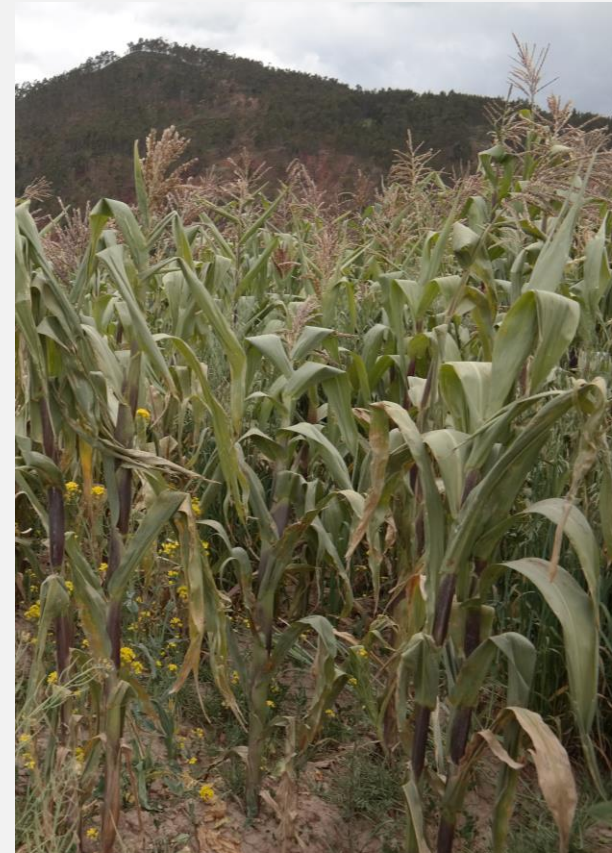# Information requirements for crop insurance

Session: Agricultural information and crop insurance – twins for success
Microinsurance Conference, Lima, 7 to 9 November 2017

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Agenda

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For what do we need good quality insurance data?

1. Pricing: What is the actuarially correct price (risk price without loadings) for the respective cover?

   - Perils covered

   - Crop type; in future: variety and respective management practices

   - Specific location of insured unit: mostly plot (spatially small differences in soil conditions and thus production potential)

   - Prevention methods: e.g. hail nets, irrigation, frost prevention

   → by each peril versus all perils

   → complex and comprehensive

   → in future: variety and management practices (e.g. fruit and wine grape production)

For what do we need good quality insurance data?

2. Risk assessment

   Loss data are lacking: pricing based on exposure

   $\rightarrow$ only for the first years of an insurance program

3. Specific underwriting questions: e.g. influence of deductible on the insurance rate
   $\rightarrow$ important for risk prevention

4. Fraud detection

1. Depending on insurance product

   - Damaged based insurance: loss data

   - Yield based insurance: yield data/yield loss data (Ø per region, per farm, per plot)

   - Index insurance based on meteorological triggers: met data

   → Note: data before applying any deductible

2. Location

   - Best practice: georeferenced on plot level

   - Other alternatives:
     o Administrative units: e.g. township, district
     o Statistical sectors (e.g. Peru)

Source: Google Maps

What kind of data?
Core insurance data

3. Size of insured unit (plot)

4. Crop type → future: variety

5. Liability data

6. Deductible: type and figure

Source: Google Maps

Who collects the data?

1. Insurance companies

2. Centralized organizations of the insurance industry

   - NCIS (USA), CIS (Australia), GDV (Germany) → collecting loss data from member insurance companies and publish them for their members

   - Pools: Agroseguro (Spain), Tarsim (Turkey): own database for whole insurance portfolio managed

3. State organizations

   - RMA (Risk Management Agency)

   - ISMEA (Italy)

→ Company data versus industry data

→ Data quality standards:

→ Who does the actuarial rate making?

Data quality and availability - where are we standing?

1. Damaged based insurance: loss data

    → for hail in developed countries (e.g. USA, Canada, Germany, Spain, Turkey): good

    → for additional perils in developed countries: divers situation:

    - very good/best practice: Spain, Austria

    - advancing: Turkey, Mexico

    - deficient: e.g. Italy

    → developing economies: hail advancing, additional perils deficient

2. Yield based insurance: yield data (Ø per region, per farm, per plot)

    → in developed countries: divers situation:

    - very good/best practice: USA, Spain

    - deficient in other countries, e.g. Italy

    → developing economies: in some advancing; majority deficient

New technologies enhancing crop insurance

1. Automatic yield recording technology: on harvesters

   ▪ Who collects the data?

   ▪ Who owns the data?

   ▪ How we will integrate this data in insurance processes?

2. Remote sensing technology

   ▪ Plot identification with exact extension

   ▪ Crop identification → monitoring of crop policies

   ▪ Monitoring of crop development (e.g. sufficient plant stand)

   ▪ Yield estimations in connection with crop growth models

     o Yield potential on specific plot

     o Actual yields (region, farm, plot)

Source: GAF AG, 2017

New technologies enhancing crop insurance
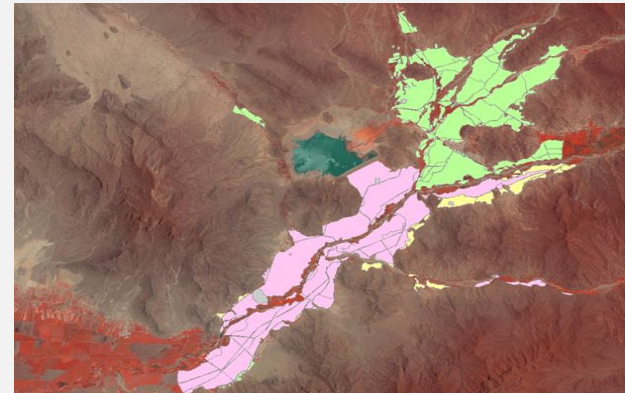
3. Data analytics → e.g. pricing, fraud detection

4. Artificial intelligence/machine learning (long term perspective):

   - Data analytics

   - Satellite image interpretation

   - Optimization of coverage needs of farmers

Summary and outlook

1. Reliable data is key to any development and advances in risk management in agriculture including crop insurance

2. The gap is widening:

   - between countries with good data collection and analysis capabilities and countries with poor data

   - between companies with good data base and companies with poor data

3. If public money is involved (e.g. premium subsidies – most insurance schemes worldwide): maximum transparency about insurance data is crucial

   → information formats and channels to be established

3. Investments are crucial for business success and for efficient ag policies:

   - data collection

   - data storage

   - data analytics

   - data sharing

   → this applies to the private <u>and</u> public sector

   → Important recommendation: if you start an insurance program implement data management right at the beginning.

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4. New technologies can support filling the gaps – but they cannot substitute the „ground" work for the time being

5. Artificial intelligence and machine learning: implications for data management and business processes in future

Thank you for your kind attention… questions?

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