Keeping Food Safe from Farm to Plate

Digital Innovations for Transforming Food Safety Outcomes in China

Mael He/何兴龙, June 2021
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We make the world more resilient.

Our Mission

Together, we apply fresh perspectives, knowledge and capital to anticipate and manage risk.

That’s how we create smarter solutions for our clients, helping the world rebuild, renew, and move forward.
A risk knowledge company

Swiss Re “Altbau”, 19th century

Swiss Re “Next”, 2017

Swiss Re

Leading Reinsurer

Founded in Zürich, 1863

>14,000 employees

Reinsurance products and services for P&C and L&H

Our Global Partnerships team supports the public sector to help increase insurance penetration around the world.

Swiss Re Corporate Solutions

Commercial insurance for mid-size & large corporations

Swiss Re Life Capital

managing open and closed life insurance books.

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How Public, Private, Partnership supports Agriculture value chain?
Main drivers point to continued strong growth

Growing population
- Growing middle classes
- Changing diets

Growing energy consumption
- Higher use per capita
- More biofuels

Crop production to rise
- Productivity challenges
- Logistics

Large investments
- Production and infrastructure

Insurance needs
- Protection of invested capital
- Risk pooling
Drivers of Public-Private-Partnerships

There is no "one-size-fits-all" system – Each system depends on market maturity

- Insurance market is immature
- Asymmetry of information for risk knowledge and risk data
- Insurance infrastructure and expertise are limited
- Deviation between Supply / Demand

- Mature insurance market with sufficient penetration rate
- Large amount of risk data and statistics available for all stakeholders
- Insurance infrastructure and expertise are abundant in a stable regulatory framework
- Access to international reinsurance
- Larger Demand for different insurance products offering development perspectives

Public tools efficiency

**Highly efficient**
- Compulsory insurance
  - Uncommon
  - Supply/Demand stimulation
- Premium subsidies
  - Very common
  - Demand stimulation
- Loss sharing
  - Uncommon
  - Supply stimulation
- Tax incentives
  - Commonly used
  - Supply stimulation
- Semi-Compulsory insurance
  - Commonly used
  - Supply stimulation
- Price control
  - Commonly used
  - Demand stimulation

**Less efficient**

- Public intervention
- Private market
- Partnership
Stakeholders in State-supported Agriculture Insurance Programs
Sharing roles and responsibilities to improve risk pooling

**Benefits:**
- Enhancing competitiveness of agricultural sector by enabling productive investment
- Open & transparent system for stakeholders
- Securing public Budget liquidity against disastrous losses

**Public Authorities**
- Design risk management policies for agriculture and draft legislation
- Co-finance premiums
- Share losses in natural catastrophes

**Farmers**
- Appropriate risk management
- Good farming practices
- Holding frequency risk that reflects normal yield fluctuation

**Crop insurer**
- Financial capacity & Loss sharing
- System administration & claims management
- Products marketing

**Global Reinsurer**
- Pooling risks worldwide
- Absorbing climatic volatility
- Bringing global expertise
- Climate change

**Benefits:**
- Individual risk cover for all natural exposures
- Reduced farmers’ income volatility
- Affordable premium rates
- Easier access to Credit and enabling LT investments

**Benefits:**
- Risk pooler in particular for disastrous losses
- International benchmark
- Long-term investments in innovation
How Swiss Re Agriculture Insurance Risk Management Platform supports Food Security?
Agro Solution

End-to-end support along your entire value chain

A dynamic, easy-to-integrate platform to do risk management

Empower agriculture risk management, help agriculture business development

- Drought, excess rain, frost, combined perils etc.
- Pre-disaster: risk identification; loss prevention; protection gap identification
- Under-disaster: risk monitoring; loss mitigation; portfolio management
- After-disaster: loss adjustment; resource allocation for loss adjustment; moral hazard reduction
A super efficient tool to develop weather-index based insurance

User-friendly API, Automatic pricing tool, Tailor-made index products

**SRAIRMP — Index Pricer**

- **Business Opportunities**
  - Diversity; Time limited

- **Data Collection**
  - Weather data collection

- **Product Design**
  - Professional; Complex

- **Risk Evaluation**
  - Actuarial report

- **Product Landed**
  - Progress tracking; Payout calculation

**Massive weather data supports**

- 2300+ national stations
- 40yr+ data with real-time update
- Temperature, wind speed, precipitation etc.

**Automatic product design**

- Machine learning and optimization algorithm to support flexible product design
- Generate standard actuarial report
- Automatically calculate claims
Swiss Re Agro Solution

Index pricer gives you a competitive advantage

Be the insurer that farmers trust. Be the agro tech leader in the market

First-class weather-index based insurance product design tool

- massive data
- Professional knowledge
- Client needs
- Market insights

SRAIRMP® key function

Multiple business needs
- Single location, single risk
- Single location, multi-risks
- Multi-locations, multi-risks
- known product proposal
- unknown product proposal
- premium rate adjustment

One stop services from underwriting to claims
- business opportunities
- underwriting
- product development
- client services
- product assessment
- claims settlement
Swiss Re Agriculture Insurance Risk Management Platform (SRAIRMP)

Full-stack agriculture insurance offering with embedded product design in a lean, modular ecosystem. Features include real-time index product design, portfolio steering, risk tracing and claims management.

SRAIRMP enables

✓ Provide automatic design for data-driven agriculture weather index insurance
✓ Real-time high resolution insights into the risk conditions of your agriculture insurance portfolio
✓ Building user-friendly data-driven API to deliver one-stop workflow service
✓ Efficient, easy to implement, scalable

What SRAIRMP clients say

Efficiency increase of product design process: 90%
Productivity gain of improved portfolio loss ratio by 15% through decrease in loss adjustment expenses
Improved portfolio loss ratio by 6% through analysis of loss drivers and predictors

SRAIRMP platform brings enhanced transparency to drought index products. Its soil moisture based index tracker enables us to better steer our agriculture portfolio and manage risks.

— Underwriters in one of top tier agriculture insurers in China
How data analytics supports Food Safety?
# How data analytics supports Food Safety?

## WHY

### SC RESILIENCE

- Supply chains are optimized for cost efficiency and vulnerable to sudden changes (like Covid-19)
- Reduce the protection gap: make the uninsurable risks manageable and insurable, leveraging data
- Global movement to achieve SDG goals by 2030 to drive businesses to operate for sustainably

## WHAT

### RISK SERVICES

<table>
<thead>
<tr>
<th>Provide Analytics &amp; Exposure Awareness</th>
<th>Provide Notification &amp; Alerting (Warnings)</th>
<th>Provide Scenario Simulation &amp; Advice</th>
<th>Marketplace for Mitigation Services</th>
<th>Marketplace for Risk Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and score risks along the whole supply chain for all industries (before something happens)</td>
<td>Predict/detect risks before something happens to allow companies to react and mitigate</td>
<td>Leverage Swiss Re’s risk intelligence to allow better risk management and improve resilience of own supply chain</td>
<td>Allow third parties to offer their services to mitigate the identified risks via a risk service marketplace</td>
<td>For all the residual risks, provide ability to create &amp; price them, offering novel insurance products, one-click away within the SCM solution (marketplace)</td>
</tr>
</tbody>
</table>

## HOW

| SCM software providers (e.g. Microsoft SCV, Microsoft Dynamics 365, BlueYonder, O9, etc.) | SCM custom-built solutions (e.g. Migros LTOpex) |
## What is available in the market to support food safety?

### Relevant Departments, Process of Food Quality Test, and Uncertainty

<table>
<thead>
<tr>
<th>WHO</th>
<th>Conduct the Food Safety Test</th>
</tr>
</thead>
</table>
| Agricultural Products Quality Inspection Center | • Tests during production process  
• No formal judgment or penalty |
| Market Supervision Agency | • Several quick tests before entering the market  
• responsible for administrative penalty |

<table>
<thead>
<tr>
<th>HOW</th>
<th>to Conduct the Food Safety Test</th>
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</table>
| Quantitative Test | • 2-week lag of the results  
• Applied in national and provincial level |
| Qualitative Test | • Rapid test with Quick but with extraordinarily high qualified rate  
• Applied in county level |

### Disposal is Unnecessary

- Unqualified products may be tested again since the degradation of pesticide
- No issuance of any follow-up notice of enforcement, products may have already entered the market due to the time lag of test

### Uncertainty During Quality Tests

- Incomprehensive Sampling
- Testing Time
- Inspector
- High Costs
What solution we are working on?

Loss Compensation Scheme based on Detection Rate

**Advantages**

- High Feasibility

**Challenge**

- Deep Integration with Third-Party Agencies

- Compensate for the costs of recycling and disposal when the test rate is unqualified;
- The rate is determined based on the test rate data of a given area and a given variety;
- Risk management is achieved through enterprise screening, production and operation monitoring, and detection plan design.
Thank you!
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