

living planet symposium

BONN
23–27 May
2022

TAKING THE PULSE
OF OUR PLANET FROM SPACE



EUMETSAT



ECMWF



AgroView[®] - Tailored Insurance Support for India

GAFAG¹
an e-GEOS (ASI / Telespazio) Company

Munich RE²

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26.05.2022

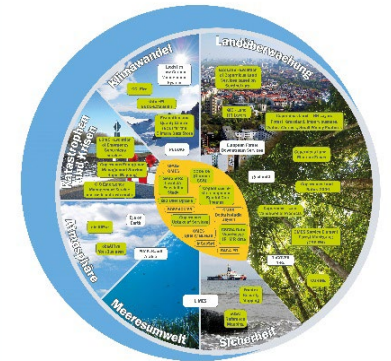


- More than 35 Years Geotechnology Solutions
- 230 Employees (Multidisciplinary Scientists – Agriculture, Forestry, Environment, Geology..)
- Munich (Headquarter) & Neustrelitz (MV)



Geoinformation: Solutions from Single Source

- **Geodata:**
 - Reception – Distribution - Processing
- **Services & Products:**
 - Geoinformation Products, Systems, Software & Integrated Satellite Services
- **Consulting Services in > 100 Countries**
 - Professional & Institutional Consulting, Project Management



Munich Re is the World's Largest Reinsurance Group



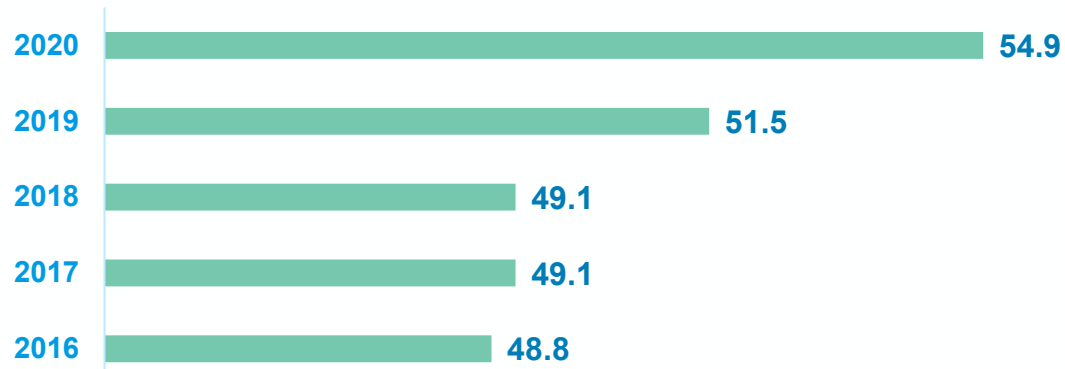
Munich Re (Group) **Munich RE** 

World's largest reinsurer by premium volume

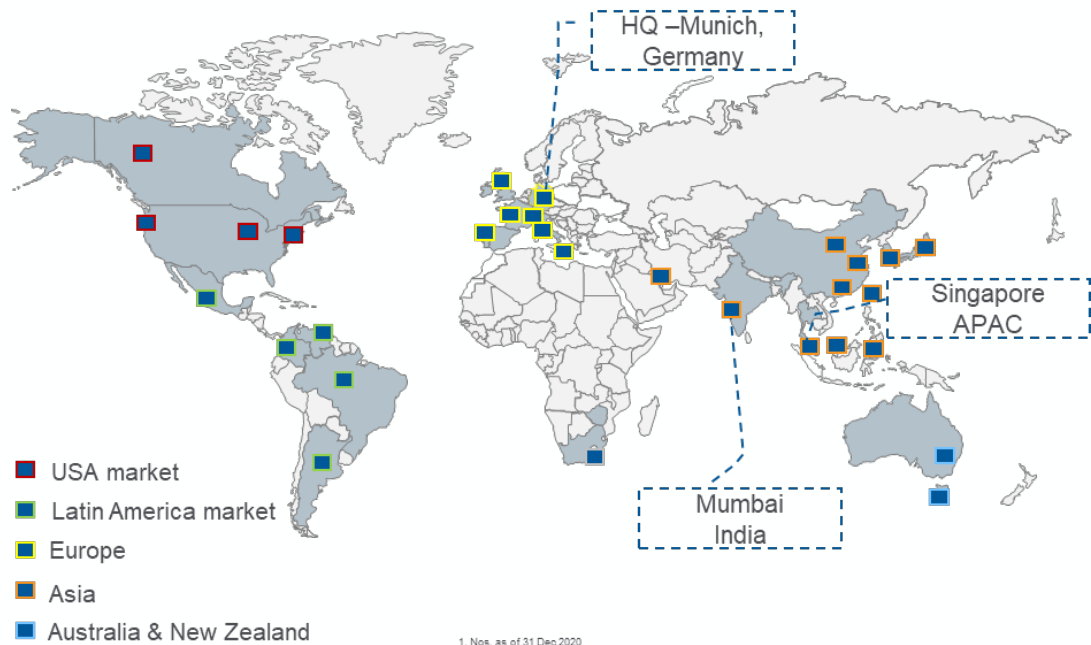
- Founded 1880
- Revenues: € 54.9 bn¹
- Assets under mgt: € 243.9 bn
- ~ 40,000 employees



Group Revenue (in € bn)



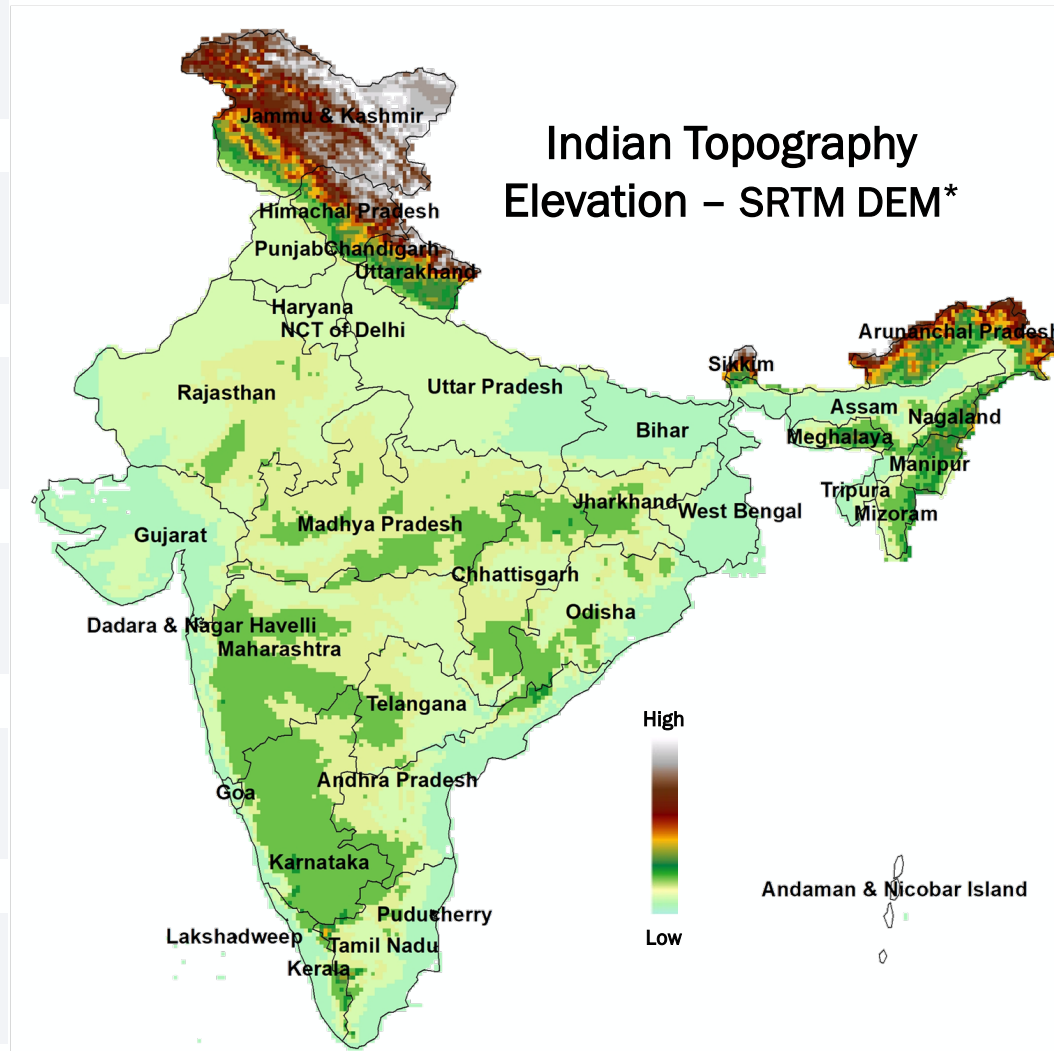
1. Nos. as of 31 Dec 2020



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Beauty of Indian Agriculture Market

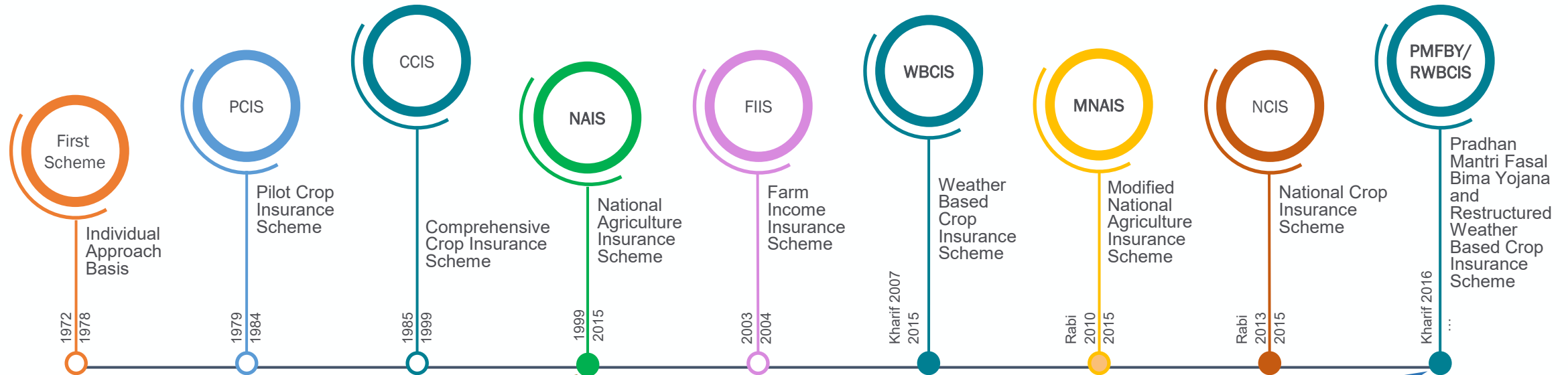
Population	1.35 bn
Area	320 mn Hec (160 mn Hec)
Language	122 (234 dialects)
Crops	~200
Population dependent on Agriculture (%)	~ 50%
Contribution to GDP (%)	~20%



No of Crop Insurance Schemes	2
Farmers covered	35 mn
Area Insured	55 mn Hec
Agriculture Crops covered	~80 crops
Horticulture Crops covered	~135 crops
Average Landholding	1.6 Hec

* SRTM: Shuttle Radar Terrain Mission; DEM: Digital Elevation Model

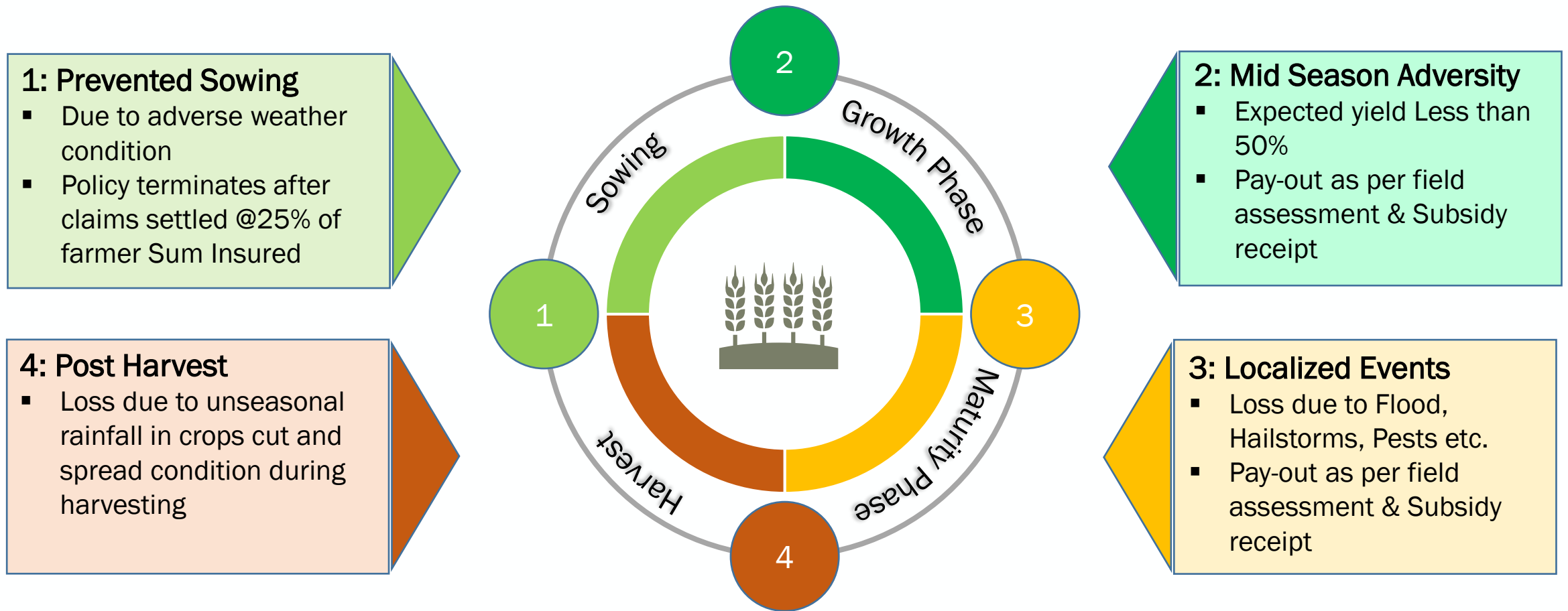
Evolution of Crop Insurance in India



- Implemented by Government Agriculture Insurance Company only
- Administrative model
- Premium fixed ~2.50%
- Claims subsidized if more than the premium collected in a state

- NAIS, MNAIS & WBCIS merged into PMFBY
- Implemented by empaneled private insurers and Government Agriculture Insurance Company
- Actuarial premium rate applicable
- Claims based on crop cutting experiment (CCEs) surveys
- Enhanced usage of technology and development of NCIP portal – Moving towards remote sensing and AI/ ML based solutions

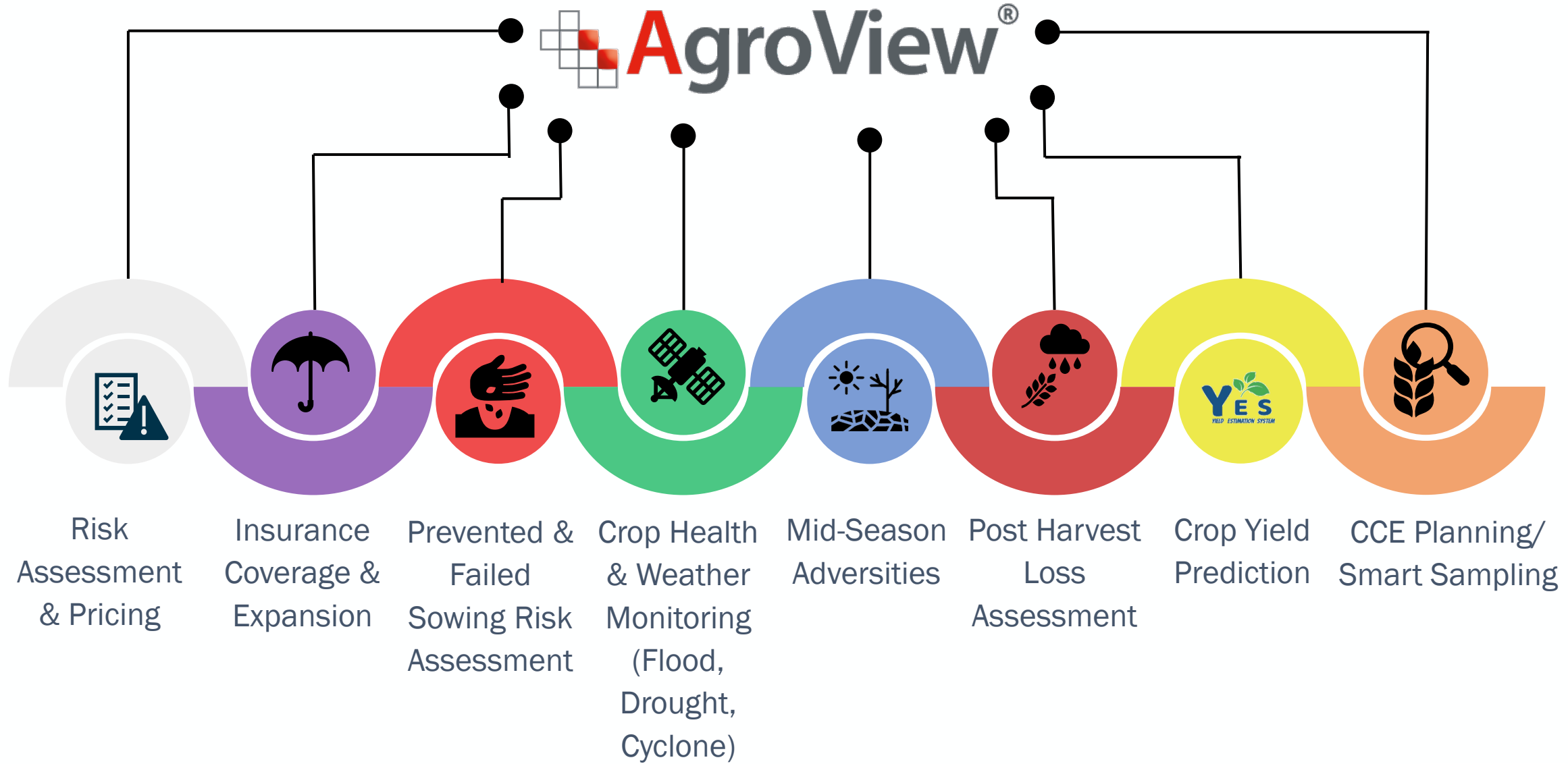
Perils Covered in PMFBY Crop Insurance Scheme



$$\text{Standard Claims} = \text{Shortfall}^* (\%) \times \text{Farmers Sum Insured}^*$$

* Where $\text{Shortfall}(\%) = \frac{(\text{Threshold Yield} - \text{Actual Yield})}{\text{Threshold Yield}}$ & $\text{Farmer Sum Insured} = \text{Insured Area} \times \text{Sum Insured per Hect of notified crop}$

AgroView® : A Complete Solution for Crop Insurance



AgroView® : A Complete Solution for Crop Insurance



AgroView® provides insights on area of interest in near real time and works as an end to end solution for crop insurance cycle



Tendering and pricing: AgroView helps in analyzing of historical weather (Drought Indices) and agriculture variations (Historical vegetation analysis)



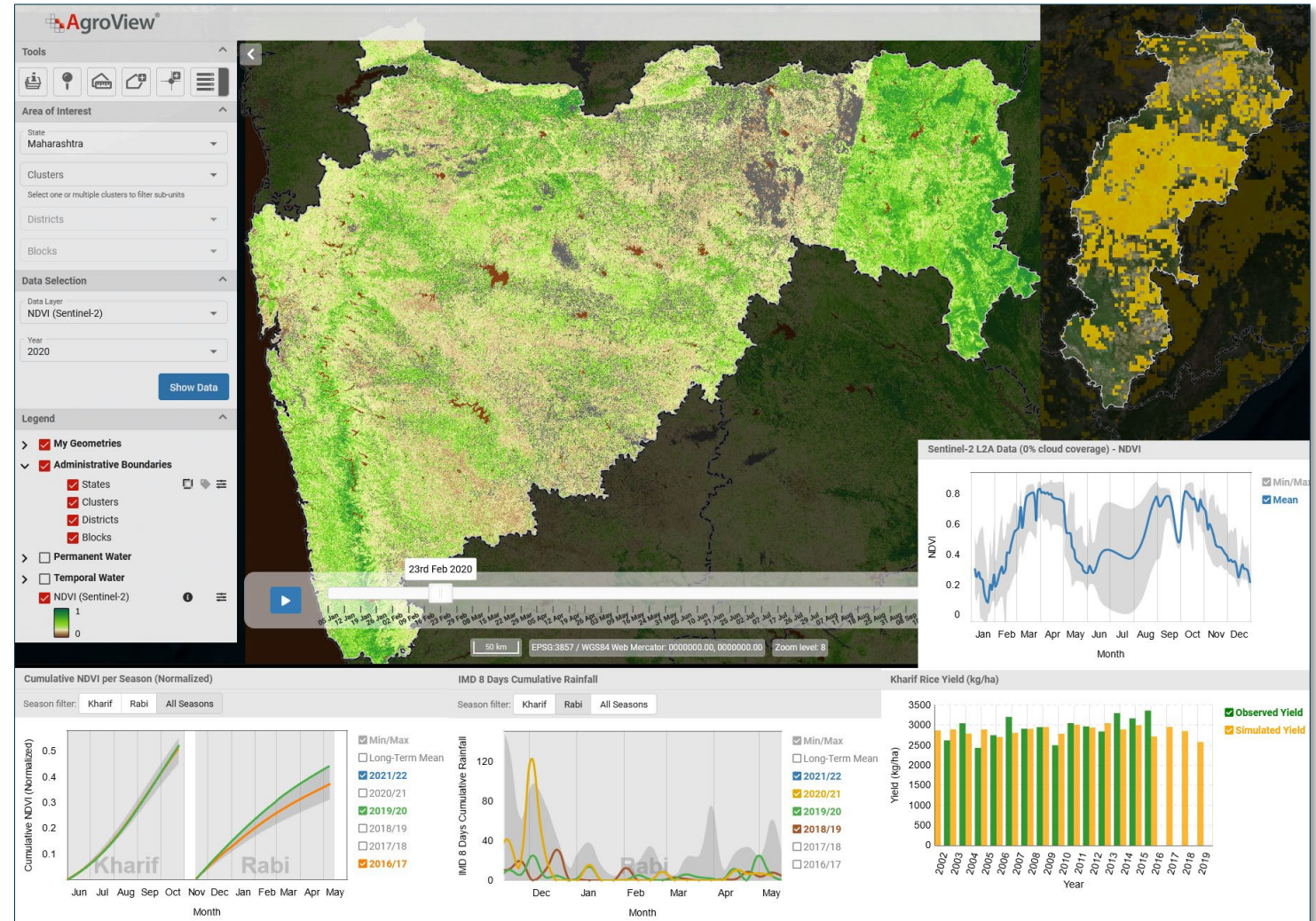
Insurance coverage and expansion: Real time and historical crop field information helps to understand land use and land cover to take a decision on target enrolment areas



Prevented/Failed Sowing Risk: Real time rainfall data and soil moisture will provide the probability of crop failure during sowing period & help in early assessment of trigger



Crop health monitoring: Observed Crop development indicators provide the crop health status and crop water stress in near real time and can help in manpower management at field to monitor the vulnerable area.





Mid season adversity: AgroView can help in analyzing mid season adverse climatic conditions like floods, prolonged dry spells (rainfall related crop stress), severe drought



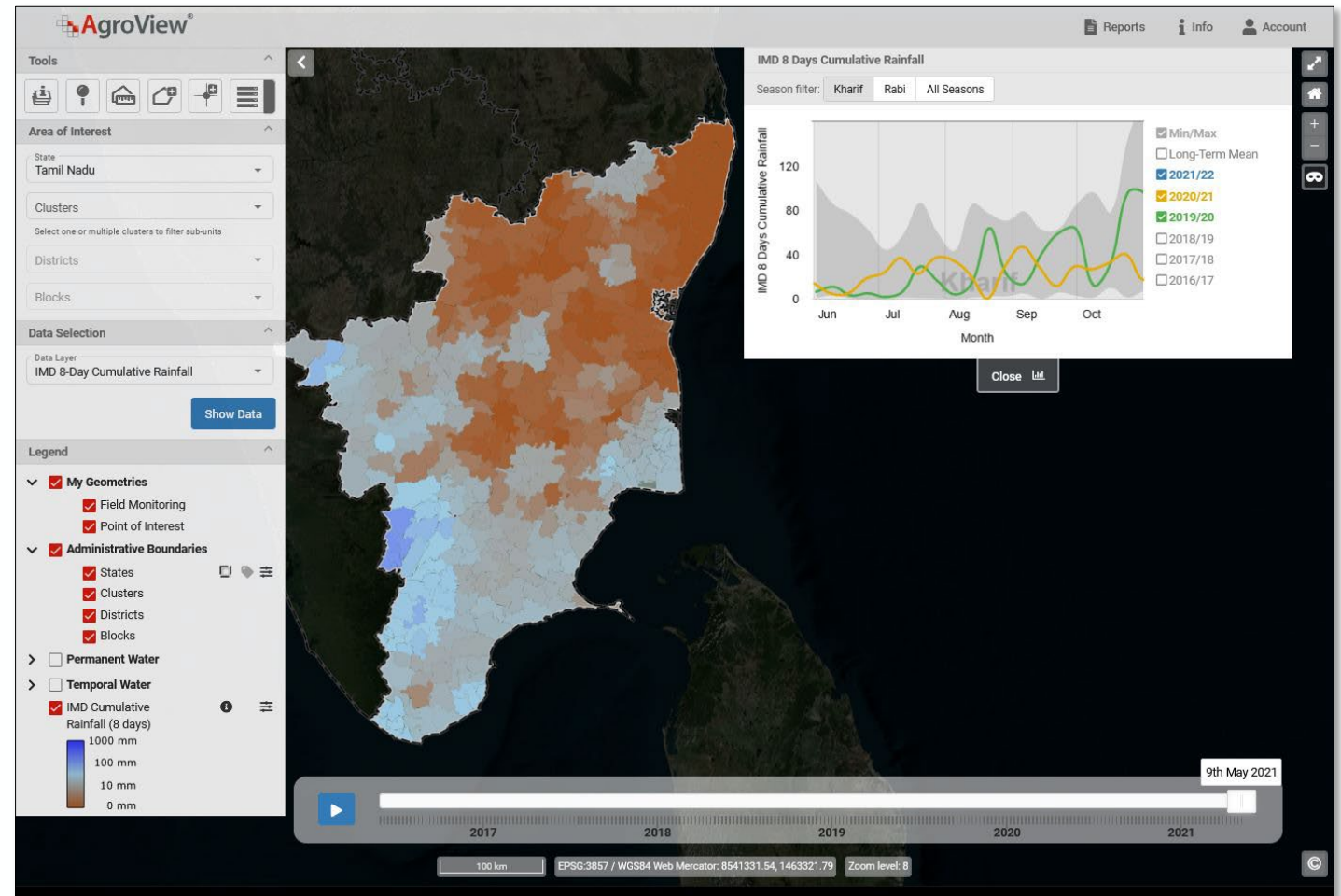
Post harvest loss assessment: Harvesting pattern can be monitored through AgroView ensuring assessment of loss by segregating peak rainfall periods



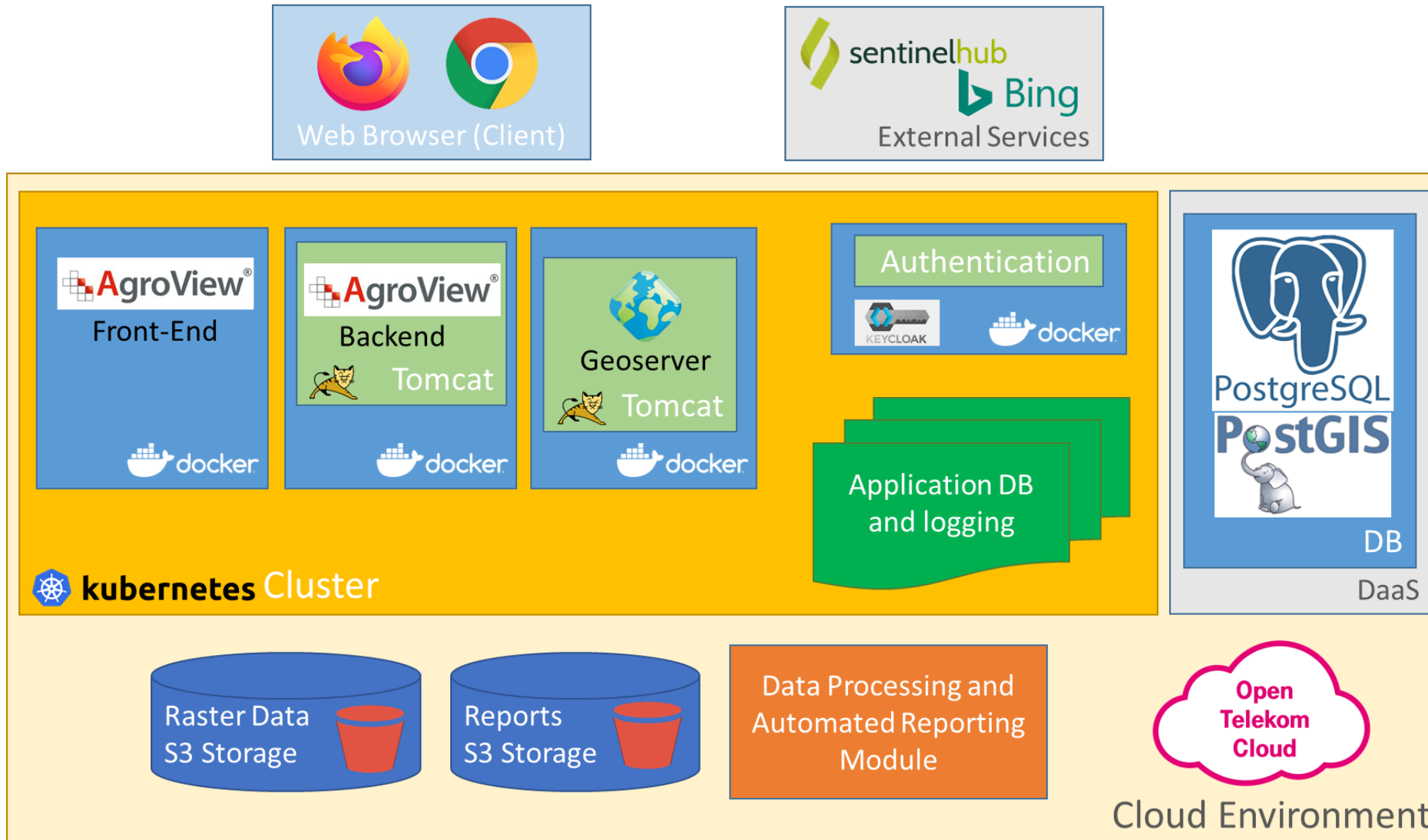
Crop yield prediction: Yield prediction system (YES) is integrated with AgroView, which is a dynamic crop yield modelling system (DSSAT) where the crop models require daily weather data, soil information, and detailed crop management as input.



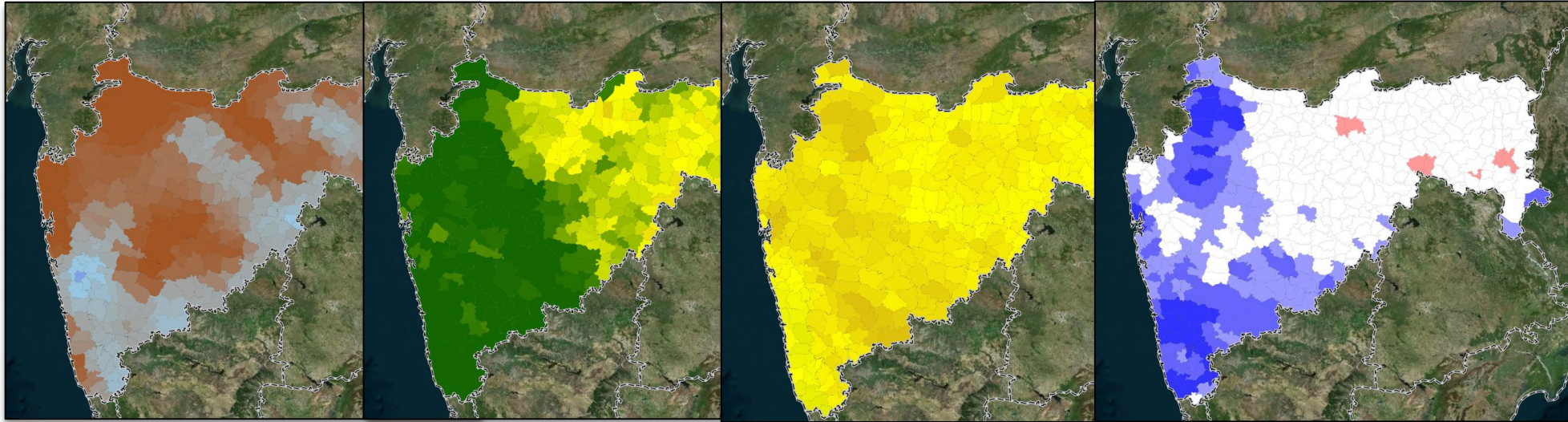
CCE planning: Crop yield through YES and stratification can capture the yield variability at field level and will help to optimize the CCE count/monitoring need similar to the future CCE plan of the Govt.



System Architecture



Multiple Datasets at Different Scales – Through Time



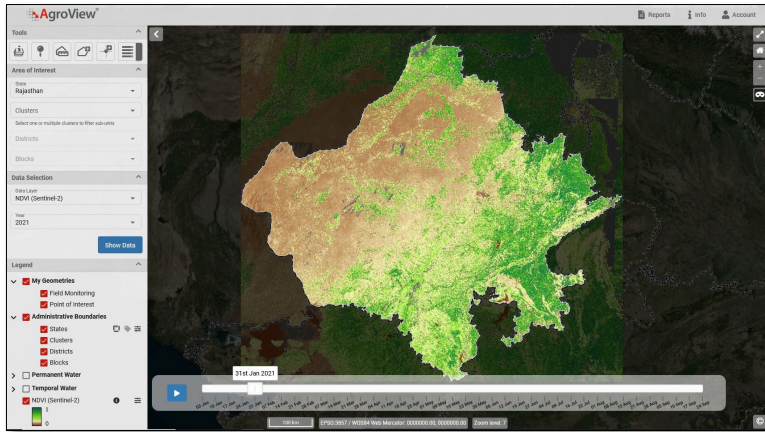
ID	Name	Cluster	District	Block	Area	Comment	Created Date
652	Shikri	01	Palasa	Pilipara	5.7164 ha	None	2023-09-27
653	Shikri Bungal	01	South Twenty Four Parganas	Pillarpurpara	6.2879 ha	Teel 1 Farm-a	2023-04-28
655	Shikri Bungal	01	South Twenty Four Parganas	Pillarpurpara	6.5651 ha	Farmer X Shrimp Pond	2023-04-21
654	Shikri Bungal	01	South Twenty Four Parganas	Pillarpurpara	8.1278 ha		2023-04-18
650	Shikri Bungal	01	South Twenty Four Parganas	Pillarpurpara	6.0294 ha		2023-04-18
652	Andhra Pradesh	01	Kanul	Jagadh-Bangula	77.9023 ha	amfkgdp	2023-05-06
651	Maharashtra	03	Pardubha	Gangalhad	2.7704 ha	agfkgdp	2023-03-26
646	India	01	Therapochapuram	Pleasilla	6.1028 ha	1284607	2023-03-26
645	India	01	North District	Chughulga	62.0226 ha	Not Yet Data	2023-01-24

State Level

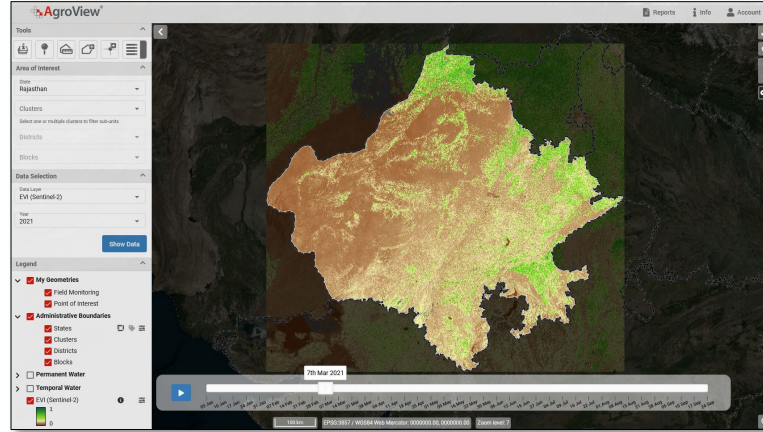
District Level

Field Level

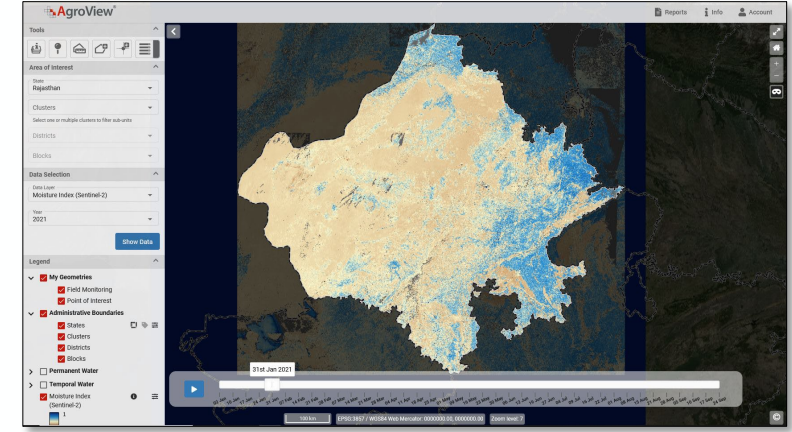
Crop Development Indicators



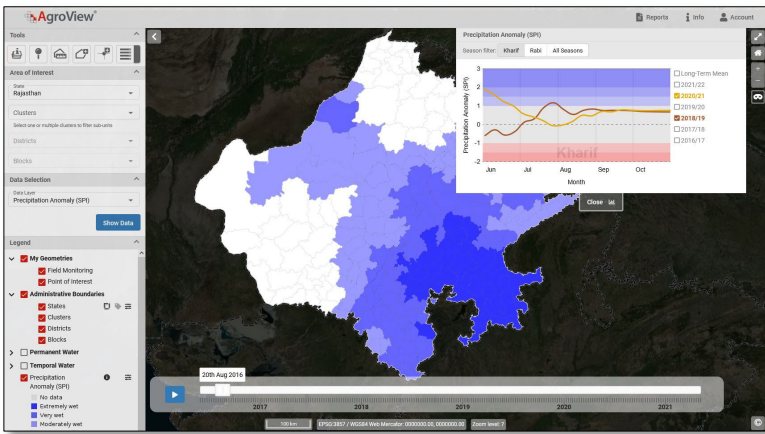
Vegetation Density Monitoring



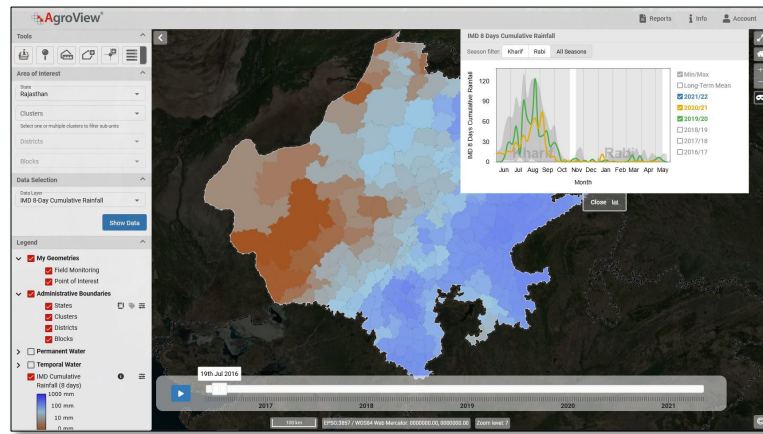
Vegetation Health Indicator



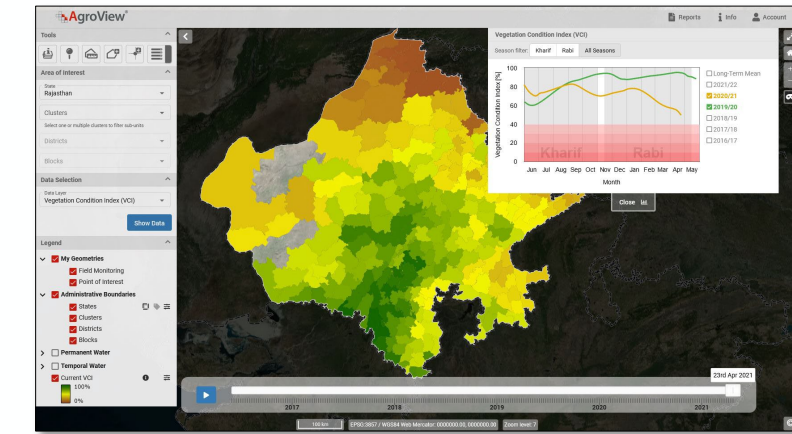
Moisture Indicator



Precipitation Anomaly



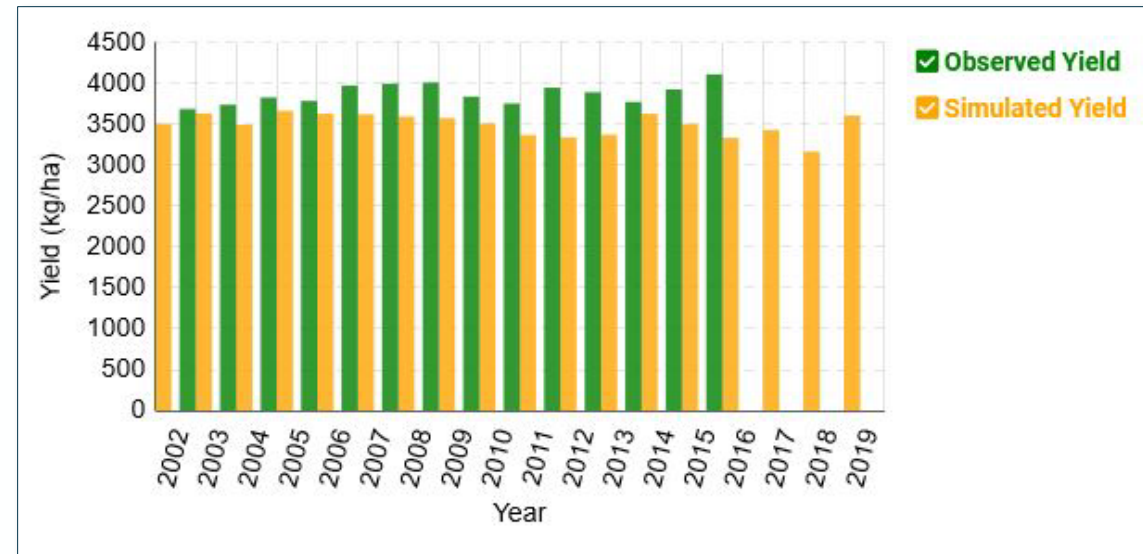
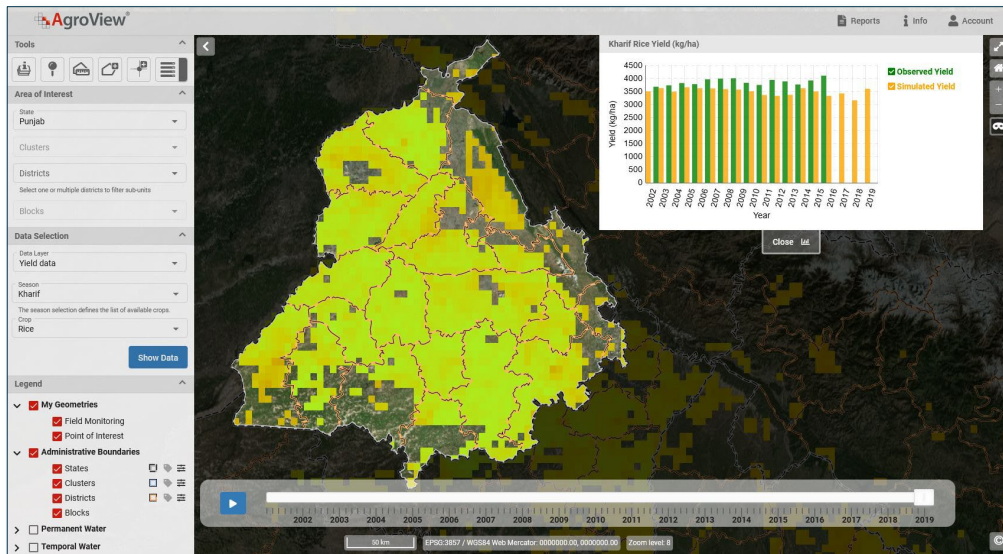
Accumulated Precipitation



Drought Indicator

Yield Estimation System YES

- Yield Estimation System (YES) is a Dynamic crop yield modelling system developed for Munich Re, India in collaboration with Potsdam Institute for Climate Impact Research (PIK)
- The Yield estimation has been developed for Rice and Wheat
- The rice model has been simulated at every 5km GRID



Fully Automated Reporting

- AgroView ® provides fully automated reporting
 - State and portfolio level
- Updates on a fortnightly basis
- Vegetation Condition and Weather Anomaly reporting
 - District- and block-wise
- Financial data reporting
- Status alerts on anomalies

1.1 Tabular Data

Table 1.1: Block-wise parameters: SPI (2021-04-15), seasonal cumulative rainfall (2020-11-09 - 2021-04-15), NDVI (2021-03-30) and VCI (2021-03-30).

State	cluster	District	Block	cumulative Rainfall			NDVI			VCI	Ret.	
				SPI	actual	normal	Δ%	actual	normal			Δ%
West Bengal	WB-01	Bardhaman	Asansol	-0.81	20.4	72.3	-71.8	0.33	0.36	-8.3	38.5	60
West Bengal	WB-01	Bardhaman	Ausgram - I	-1.99	11.2	74.6	-69	0.4	0.43	-7	36.5	63

Crop type contribution to GWP per district

Deviation: ● Seasonal Rainfall ● Current NDVI

Gram (Chana)

Kabeergham, Barampur, Bitaspur, Rajpur, Gourela-..., Bastar

Deviation from Normal

0% -30% -60%

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Status: Good

Observations indicate normal to favourable conditions in all blocks of Balrampur.

Status: Moderate

Observation-based status per block in Darjeeling:

Moderate: Darjeeling Pulbazar, Jorebunglow Sukiapokhri, Kharibari, Kurseong, Mirik, Rangli Rangliot, Siliguri.

Good: Gorubathan, Kalimpong - I, Kalimpong - II, Matigara, Naxalbari, Phansidewa.

Status: Watch

Observation-based status per block in Purba Medinipur:

Moderate: Bhagawanpur - I, Bhagawanpur - II, Chandipur, Contai - I, Contai - III, Deshopran, Egra - I, Egra - II, Haldia, Khejuri - I, Khejuri - II, Kolaghat, Mahisadal, Nanda Kumar, Nandigram - II, Panskura, Potashpur - I, Potashpur - II, Ramnagar - I, Ramnagar - II, Sahid Matangini, Sutahata, Tamluk.

Watch: Moyna, Nandigram - I.

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The current situation and was automated data sets. This report is provided "as-is", merchantability, fitness for particular purposes. GAF AG does not warrant the accuracy, completeness of this report. In no event shall GAF AG be liable to incidental, incidental or punitive damages or any special damages not limited to, any loss of revenue, profit or data. This report is for the use of the client (and its business partners) only and may not be used for any other purpose without the consent of GAF AG.

- ✓ In operational use by Munich Re since 2020
- ✓ Used on National Scale
- ✓ Increasingly used as well by Major Insurance Clients
- ✓ Fast Integration of Processed Satellite Data
- ✓ Data Analytics available when needed & down to Field Level
- ✓ Numerous Built-in Tools and Functionalities
- ✓ User Friendly Packaged Technology
- ✓ Easy Browser Access – no plugins/ software installation required
- ✓ Works on All Types of Devices

Thank you for your Attention!



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