RELIANCE
General Insurance

Reliance General Insurance Leverages GIS Technology for Crop Insurance

The agriculture industry is known to operate in the most volatile environment. Despite the volatility, agriculture continues to be one of the largest employment generating sectors in India. However, the sector is constantly subjected to vagaries of nature such as floods, landslides, cyclones, etc. severely affecting crop output and farm income. Such risks not only impact farmers but the entire supply chain including the food industry. In line with the Pradhan Mantri Fasal Bima Yojana (PMFBY), Reliance General Insurance (RGI) provides crop insurance schemes protecting farmers against financial losses due to unforeseen crop losses.

In any industry insurance payout is based on the actual loss and in the agriculture sector crop damage insurance covers losses due to specific perils such as flooding, droughts, hailstorm, etc. The level of risks involved in agriculture insurance made it necessary for RGI to ensure its crop insurance solution not only covers farmers' production and financial risks but also the ability to first analyze and assess the potential risk to farmland and accordingly charge a premium. RGI invested in satellite-based analysis, which helped in addressing risks in crop health during the on-going season, sowing patterns, area sown, localized calamity, and yield estimates.

Esri India team implemented ArcGIS (Aeronautical Reconnaissance Coverage Geographic Information System) and ENVI (Environment for Visualizing Images) software, satellite-based remote sensing technology helped accessing satellite-based information and analytics, and quick high-resolution images processing. Analytics helped RGI gain

visibility on crop classification and acreage estimation; crop health monitoring; loss event monitoring, and yield estimation. The GIS technology intervention helped RGI eliminate the on-field physical visits to every gram panchayat/ village/ to monitor crop health and identify risks and also reduced the operational and administrative costs involved.

Challenges

In agriculture, like many other industries, it is critical to identify potential risks, in the beginning, and take necessary risk mitigation steps, to reap benefits at the later stage. Reliance General Insurance wanted to measure in-season crop health to identify potential risks to crop production or farmland at the beginning of the season to accurately estimate the risk and calculate the premium. However, due to variations in season and diverse types of crops grown in multiple agro-climatic regions, monitoring crops was a major challenge. Below, some of the major challenges faced by RGI:

• Difficulty in classifying crops spread across multi-cropped areas

• Acreage estimation in multi-cropping fields

• Identification of plant and disease

• Physical verification of damaged crops using mobile applications

• Data collection and data processing cost

• Reduction of Crop Cutting Experiment (CCE) in heterogeneous fields
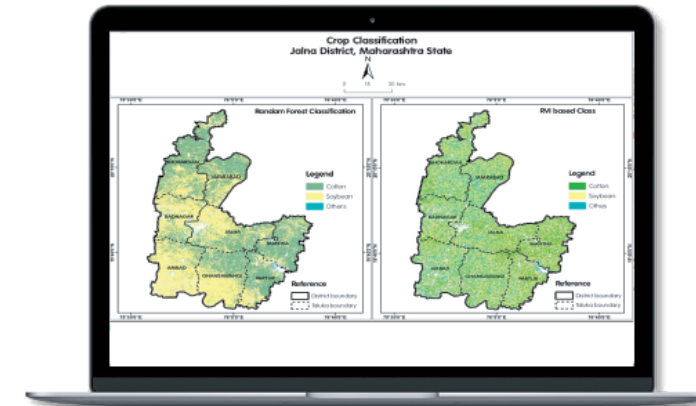
Solution

The agriculture sector, being the backbone of India's economy also faces challenging times such as beleaguered farmers' rendezvous with farm crisis and lack of technology intervention. Today, the sector requires a solution that not only fosters innovation but can assess the damage most accurately and further enable faster loss adjustment and payout to the insureds. In the crop insurance business, high-resolution imagery plays a key role in speeding up the claim process. Esri technology helped RGI with cutting-edge mapping, analytics software ArcGIS, and image processing software ENVI offering field data collection, real-time data feeds, intuitive data visualization, processing, and analysis.

The solution provided by Esri supported by accessing satellite images of a particular area/crop field followed by processing the images. ArcGIS ensured rapid data collection and real-time analysis. ENVI assisted in processing satellite images and revealed the below insights:

• Total count of the crops in an agricultural field Location and sizes of the agricultural field

• Identify different crop rows in the field and also gaps within a row

• Damage to the field, crops, and plants

• Hotspot image displaying the health of vegetation in a single field or a larger geographic extent

Once all satellite images are processed, the crucial insights are mapped to further assess the damage, develop dashboards, high-level summary reports for crop-planning, crop-management, harvesting, and administrative planning. ArcGIS and ENVI together helped in rapid and accurate data processing that further assisted in identifying risk-prone areas in a cluster or a district. The software also helped in-season crop health monitoring which enabled prioritizing areas prone to exposures and diverted efforts towards attending the same.

Benefits

The integration of ENVI, the latest spectral image processing, and ArcGIS, analysis technology with an intuitive and user-friendly interface from Esri India helped Reliance General Insurance attain actionable and meaningful information. The use of satellite technology has helped RGI with quicker turn-around and cuts down on costs.

The process implemented by Esri eliminated the time taken to physically monitor large scattered geographies to assess and analyze the vegetative index, water index, soil index, leaf area index, etc. The satellite-based analysis helped RGI in early monitoring of crop sown area and prediction of 'prevented sowing'. Today, RGI has successfully implemented insurance schemes for the FY 2020-21 in 35 districts across 4 states in India and has saved a considerable sum of money on manual/ operational interventions. Below, some of the benefits:

• Faster claim process and payouts in return uplifting customer satisfaction

• Visibility on in-season crop condition at different time intervals fostering risk analysis and decision making

• Crop classification and crop risk analysis enabled estimating the crop yield

• Acreage estimation of different crops

• Identification of Inundation area an exposure monitoring

• Significantly reduced time taken to physically verify farmland

• Reduced operational and data processing cost

Reliance General Insurance Company Ltd (RGI) is the fourth largest non-life insurance company. With 135+ offices/branches across India, the company is backed by the support of 3,600+ employees. RGI offers a plethora of insurance solutions for auto, health, crop, home, property, travel, marine, commercial, and other specialty products with a massive customer base that includes individuals, companies, as well as SMEs.