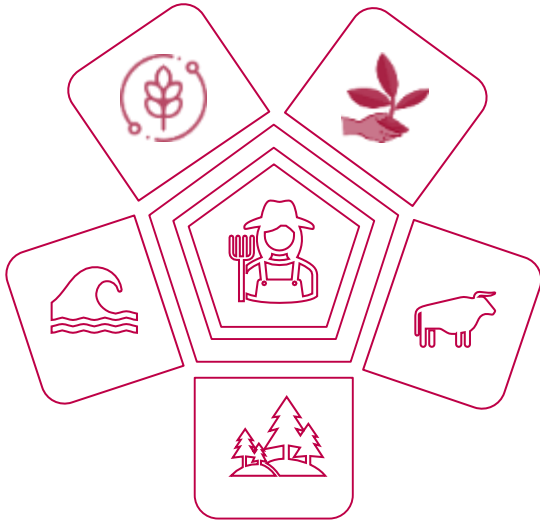


Climate change mitigation and sustainable food production through 5G enabled sky and earth data convergence approach



# Overview of TCS Digital Food Initiatives

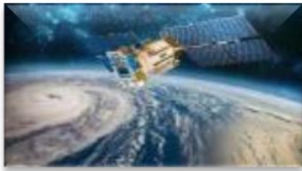


## Key Highlights

- **2 million+ farmers & 300+ million hectares coverage**
- **100+ AI/ML Models & Algorithm covering 25+ crops globally**
- **100+ Patents in the space of Food and Agri Solutions**
- **20+ Innovation partners co-creating the solution**
- **80+ domain & technology experts**
- **50+ customers including Government bodies, Agribusinesses, Banks, and Insurance**
- **20+ National and International Awards including recognition from Bill and Melinda Gates foundation**

# Digital Food Initiatives “focus areas” addressing the market challenges

Driving climate smart agriculture & sustainable food production through data-driven, Sky and Earth convergence approach & ecosystem partnership



***Sustainability  
and Farm2Table  
Visibility***



***GHG Emissions –  
Carbon Farming***



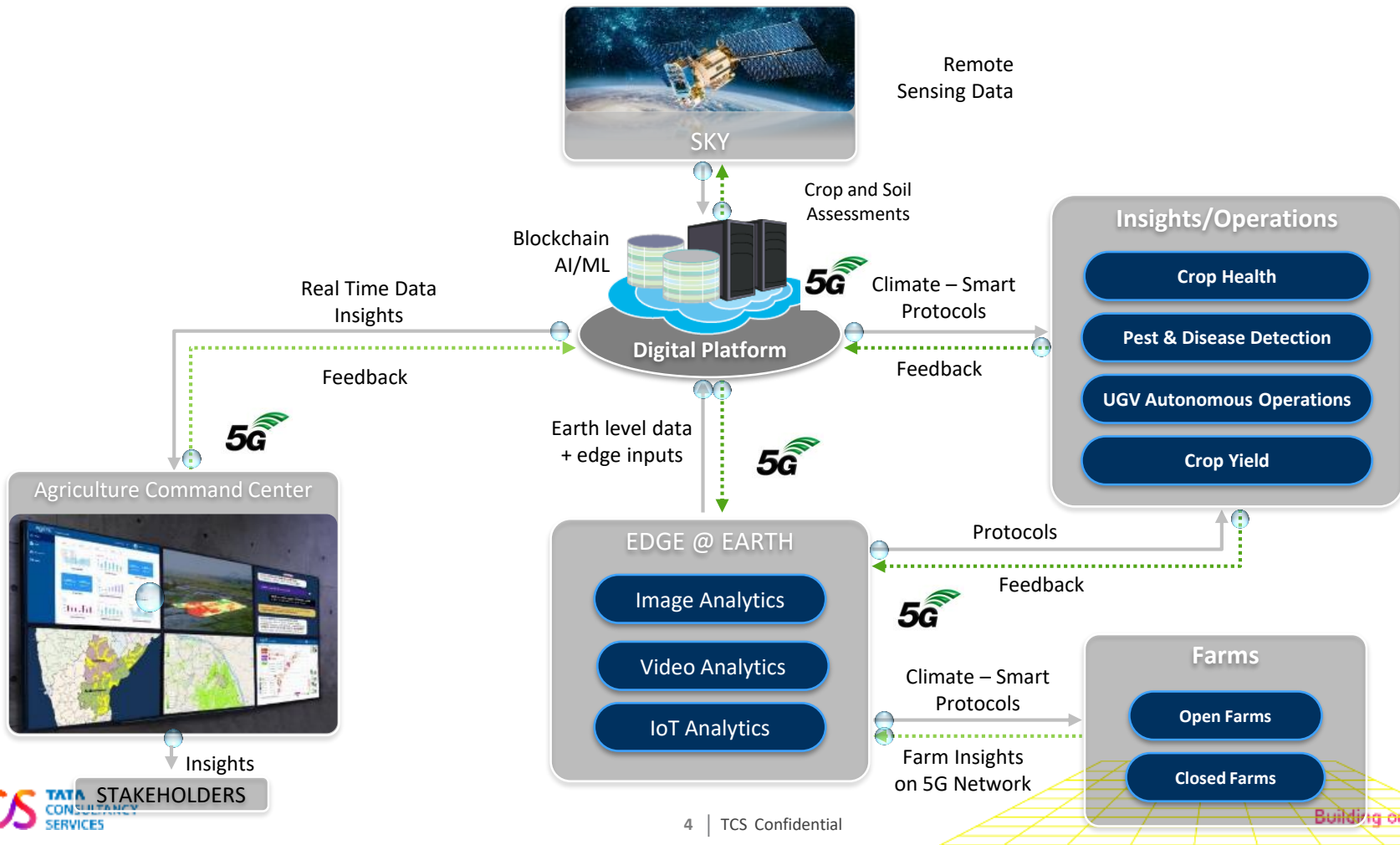
***Soil & Water  
Stewardship***

**Large European Agri Processing Company** – *Monitoring precise field conditions to improve Barley Supply Chain planning and overall product profitability by >10%*

**Large European Bank - Innovative Sky and Earth convergence approach** *to monitor compliance to sustainable farming practices and measure carbon stocks at <\$2 per ha*

**Large Agri Input Company - Field level crop monitoring optimizes inputs by >15% & improves sustainability of crop production**

# 5G Enabled Architecture using SKY-Earth Data Convergence



# TCS' Digital Farming - Example Use cases for Demonstration

Use case Summary	Usecase Description	Expected Benefits
<p><b>UC-1:</b> Leverage 5G network in streaming farm videos and images to DFI Platform and <b>provide near-real time crop health analytics remotely</b></p>	<ul style="list-style-type: none"> <li>Utilize 5G ultra low latency and multi-Gbps peak data speed to continuously stream HD/4K content from farm to cloud and bring analytics from cloud to farm. While high resolution video stream uploads are expected in sub-second range, delivery of analytics is expected in &lt;100 milliseconds</li> </ul>	<ul style="list-style-type: none"> <li>Faster and more precise data collection through Mobile Camera leveraging 5G mobile broadband and transfer to cloud infrastructure with low latency for real-time processing</li> <li>Reduce the overall farm level expenses by precise monitoring of the farm and generate micro level insights that allows farmers to take targeted action and reduce input expenses</li> </ul>
<p><b>UC-2:</b> Leverage 5G network for performing <b>remote operation of farm using UGV</b> (Unmanned Ground Vehicles)</p>	<ul style="list-style-type: none"> <li>Utilize 5G ultra low latency and multi-Gbps peak data speed to continuously stream HD/4K content from farm to cloud and bring analytics from cloud to farm. While high resolution video stream uploads are expected in sub-second range, delivery of analytics is expected in &lt;100 milliseconds</li> <li>With ultra low latency, high reliability of 5G and larger coverage to users, farmer will be able to control the UGV in realtime, without worrying about delay or loss of data packets while controlling the UGV remotely</li> </ul>	<ul style="list-style-type: none"> <li>Generate Near real-time insights to take actions on the ground – UGV for spot spraying on weeds etc.</li> <li>Improve farm level productivity by precise monitoring of the crop stress and actionable recommendations</li> <li>Automation of farm level ground data gathering reduces the need for manual scouting and hence reduction in operational expenses</li> </ul>
<p><b>UC-3:</b> Leverage 5G network for performing remote <b>DSS (Decision Support System)</b> in the farm like Smart Irrigation, Smart Fertigation, Farm Surveillance extended to Farm management activities including <b>Pest and Disease detection, Crop condition monitoring</b></p>	<ul style="list-style-type: none"> <li>Utilize 5G ultra low latency and multi-Gbps peak data speed to continuously stream HD/4K content from farm to cloud and bring analytics from cloud to farm. While high resolution video stream uploads are expected in sub-second range, delivery of analytics is expected in &lt;100 milliseconds</li> <li>With ultra low latency, high reliability of 5G and larger coverage to users, farmer will be able to control the smart systems in realtime, without worrying about delay or loss of data packets while controlling them remotely. These smart systems <b>are IoT / Edge devices, Cameras and Control Systems</b></li> </ul>	<ul style="list-style-type: none"> <li>Generate Near real-time insights to take actions on the ground – enabling decision support system for spot for quick &amp; needed actions</li> <li>Improve farm level productivity by precise monitoring of the crop stress and actionable recommendations</li> <li>Automation of farm level ground data gathering reduces the need for manual scouting and hence reduction in operational expenses</li> <li>Reduction in manpower required for various day-to-day farm operation activities</li> </ul>

| Building on belief

Thank you

