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DHRUVA SPACE

Democratizing Earth Observation for Emerging Nations Through EOaaS Innovation

A strategic alliance between Dhruva Space and SatSure & KaleidEO delivers sovereign, scalable, and intelligent EO infrastructure tailored to national priorities and mission-ready deployment needs.

White Paper I January 2026

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Foreword

Sanjay Nekkanti
Co-founder & CEO, Dhruva Space

The value of Earth Observation (EO) lies not only in seeing the planet, but in understanding it, and in ensuring that the correct understanding is available when and where it matters most. Yet across much of the world, this promise remains unevenly realised. Many developing countries and emerging Space programs continue to depend on external EO infrastructure, facing delays, unreliability, and high procurement costs that limit the usefulness of EO data for real-time decision-making.

These limitations have underscored the need for a more integrated approach to EO delivery i.e. one that unites technology, operations, and decision-making within a single, coherent system.

This white paper is a product of that approach. Developed jointly by Dhruva Space, KaleidEO, and SatSure, it presents Earth Observation as a Service (EOaaS) – a sovereign-ready model that brings together satellite platforms, payloads, launch access, ground infrastructure, and analytics into one end-to-end capability.

For Dhruva Space, this represents the next step in our full-stack approach to Space engineering, connecting mission design, integration, launch, and ground operations through a cohesive delivery model. Our core expertise in building and deploying robust, customised satellite platforms and providing reliable access to the Space infrastructure is the foundation upon which EOaaS is built.

We believe EOaaS can transform how nations and industries access and apply EO data. It enables Governments and Enterprises to operationalise EO rapidly and affordably without decades of institutional build-up, while retaining full sovereignty over their data and assets.

By creating the conditions for true operational autonomy, where information flows seamlessly from orbit to action, EOaaS makes Space-based intelligence an integral part of governance and enterprise, facilitated by India's private Space sector as a trusted technology partner.

Foreword

Arpan Sahoo
COO, KaleidEO

In a world where every decision is increasingly time-critical, the ability to access, interpret, and act on Earth Observation (EO) data in near real-time is no longer a luxury – it is a strategic necessity.

At SatSure, we've always believed that EO must evolve beyond data acquisition into a robust decision intelligence ecosystem. Our end-to-end analytics platform and industry-specific applications have already made EO relevant at a global scale across sectors such as agriculture, banking, infrastructure, and aviation.

That's why we are building a fully integrated Earth Observation-as-a-Service (EOaaS) model – combining satellite platforms, advanced payloads, launch-readiness, ground infrastructure, ARD processing, and contextual analytics into a unified, mission-ready stack. Powered by upstream innovations from our subsidiary KaleidEO, this system reflects our vision of modular, scalable, and precision-driven EO infrastructure.

As part of this journey, we are collaborating with ecosystem partner Dhruva Space to ensure upstream capabilities are aligned with downstream needs. This ecosystem approach ensures that users don't just get data—they gain access, autonomy, and actionable intelligence.

The transformation ahead is not only technological—it's strategic. Our goal is to move EO from a fragmented, outsourced service to a sovereign, scalable capability built around real-world use cases.

I'm proud to share this journey with you, and hope this white paper sparks meaningful conversations and bold collaborations for the future of EO.

Executive Summary

Earth Observation (EO) has become foundational to modern governance and enterprise decision-making, underpinning critical functions across climate resilience, food security, infrastructure management, disaster response, and national security. Yet for many nations and industries, the ability to operationalise EO remains constrained by systemic inefficiencies across the value chain.

Despite advances in satellite technology and increased commercial participation, EO access is still shaped by fragmented procurement models, high data latency, dependence on foreign-owned assets, and limited integration between upstream infrastructure and downstream decision systems. These challenges are particularly acute for emerging Space nations and mission-critical users, where delayed or discontinuous EO intelligence directly impacts response effectiveness, economic outcomes, and strategic autonomy.

This white paper presents Earth Observation as a Service (EOaaS) as a structural response to these limitations. EOaaS reframes EO delivery from a collection of discrete services into a unified, operational capability—one that aligns satellite infrastructure, mission operations, data processing, and analytics around defined decision outcomes rather than standalone assets or datasets.

Developed jointly by Dhruva Space, SatSure, and KaleidEO, the EOaaS framework reflects a vertically integrated approach spanning satellite platforms, payloads, launch access, ground infrastructure, and contextual analytics. The collaboration leverages Dhruva Space's full-stack satellite engineering and ground segment capabilities, KaleidEO's modular EO payload and infrastructure services, and SatSure's sector-specific analytics and decision intelligence platforms.

Anchored in India's evolving Space policy environment and increasing private-sector participation, the model demonstrates how upstream and downstream integration can reduce complexity, compress deployment timelines, and improve continuity across the EO lifecycle. More importantly, it enables governments and enterprises to retain control over data, assets, and mission priorities while accelerating the transition from raw imagery to operational insight.

EOaaS is not positioned as an incremental improvement to existing EO procurement models, but as a systems-level redesign aligned with the realities of time-critical decision-making in the 21st century. This paper outlines how such an approach can support sovereign capability development, reduce long-term dependency, and embed EO as a persistent, decision-ready layer within national and enterprise operations.

Snapshot

As the global demand for timely, high-resolution geospatial intelligence accelerates, EOaaS emerges as a critical solution, particularly for emerging economies and rapid-onset disaster scenarios. This whitepaper outlines a scalable, sovereign-ready EOaaS framework enabled through vertically integrated satellite infrastructure and contextual geospatial analytics.

Bridging the Data, Capability, and Intelligence Gaps

Emerging nations often face restricted access to localised EO data due to reliance on foreign platforms, fragmented data ecosystems, and the absence of scalable analytics frameworks. EOaaS mitigates these challenges through autonomous asset access, high temporal resolution, and industry-aligned analytics.

End-to-End Technology Stack

A full-stack satellite approach, spanning satellite design, launch, GSaaS-enabled ground operations, cloud-based processing, and decision intelligence layers, ensures low-latency, mission-specific data delivery. The integration of geospatial analytics into sector workflows enables real-time operational insights across domains.

EOaaS in Action

The model supports applications across disaster response, agriculture, utilities, and infrastructure through a plug-and-play architecture that scales with national priorities. Sovereign asset control and modular training pathways promote self-reliance and long-term resilience.

Delivery Model and Pathway

The EOaaS business model emphasises needs-based engagement, co-designed technology roadmaps, and capacity-building initiatives. This ensures seamless integration into government and commercial operations while aligning with global standards for Space sustainability and data governance.

Together, these approaches from Dhruva Space, SatSure, KaleidEO, a wholly owned subsidary of SatSure, form a future-ready EOaaS ecosystem, driven by mission ownership, powered by innovation, and built for decision dominance.

1. Current Scenario

Emerging Space nations are actively investing in EO capabilities. However, few have achieved true end-to-end sovereignty. Despite growing ambitions, they continue to face significant structural barriers — including the lack of enterprise-scale infrastructure, seamless business process integration, and timely, reliable access to EO data. These limitations hinder their ability to derive real-time, impactful geospatial intelligence that can drive national development, security, and resilience — at the speed and scale today's world demands.

The Government of India is prioritizing the EO-PPP model to enhance national security and development capabilities, and reduce strategic dependency on foreign EO datasets. By incentivizing private players to design, deploy, and operate high-resolution EO constellations — underpinned by anchor tenancy and viability gap funding — the initiative aims to ensure persistent coverage, improve temporal resolution, and create a robust downstream geospatial data economy aligned with national security and development goals.

The EO industry itself is undergoing a profound shift. Once the domain of government Space agencies and defence contractors, it has been transformed by rapid technological innovation and private sector participation. Smaller, smarter satellites have redefined access and affordability, while cloud-native data architectures are replacing traditional on-prem systems — freeing organisations from infrastructure-heavy operations and allowing them to focus on downstream insights and decision-making.

Despite progress, critical gaps persist, especially in emerging economies, where reliance on fragmented data sources, foreign satellites, and siloed systems hamper real-time intelligence. Challenges like data latency, low revisit frequency, and lack of interoperability prevent EO from being fully embedded into governance, policy-making, and industry operations. As a result, EO remains underutilised in addressing national priorities.

The Data Gap

Emerging Space programs and nations frequently encounter significant barriers to accessing high-resolution, localised EO data, a situation predominantly shaped by their reliance on foreign satellites and commercial platforms. Countries like Fiji depend almost entirely on satellites owned and operated by foreign governments and companies for their Space services. This external dependence severely limits their capacity to obtain timely, sovereign, and customisable EO information, as seen in the case of emerging Space nations that typically engage in paid 'timeshare' arrangements or data purchases from commercial imagery providers.

High data latency and low revisit rates present significant obstacles to the effective use of EO data, particularly in emerging economies. These limitations impede timely decision-making in critical scenarios such as disaster response, agricultural monitoring, and environmental management. In regions vulnerable to rapid-onset events, the lack of near real-time geospatial intelligence can drastically undermine operational readiness and the efficient allocation of resources.

Compounding these issues is the highly fragmented nature of the current global EO data ecosystem. Datasets originate from a multitude of satellites, sensor types, and custodians, each possessing unique formats, coverage areas, and update cycles, often lacking interoperability or standardised access points. Addressing data interoperability challenges through scalable strategies and federated processing platforms is crucial for unlocking the full potential of EO.

The Capability Gap

One of the most pressing challenges faced by emerging Space programs and commercial EO users is the lack of unified infrastructure and operational coherence across the EO lifecycle. From satellite design and manufacturing to in-orbit tasking, ground station management, data acquisition, and analytics delivery — each stage often requires coordination across multiple vendors, agencies, and service providers.

This fragmented approach introduces delays, increases operational overhead, and creates barriers to timely deployment and scalability. Additionally, organisations lacking in-house capacity to manage these complex, interdependent systems face further challenges in ensuring data continuity, system reliability, and cost efficiency.

The Intelligence Gap

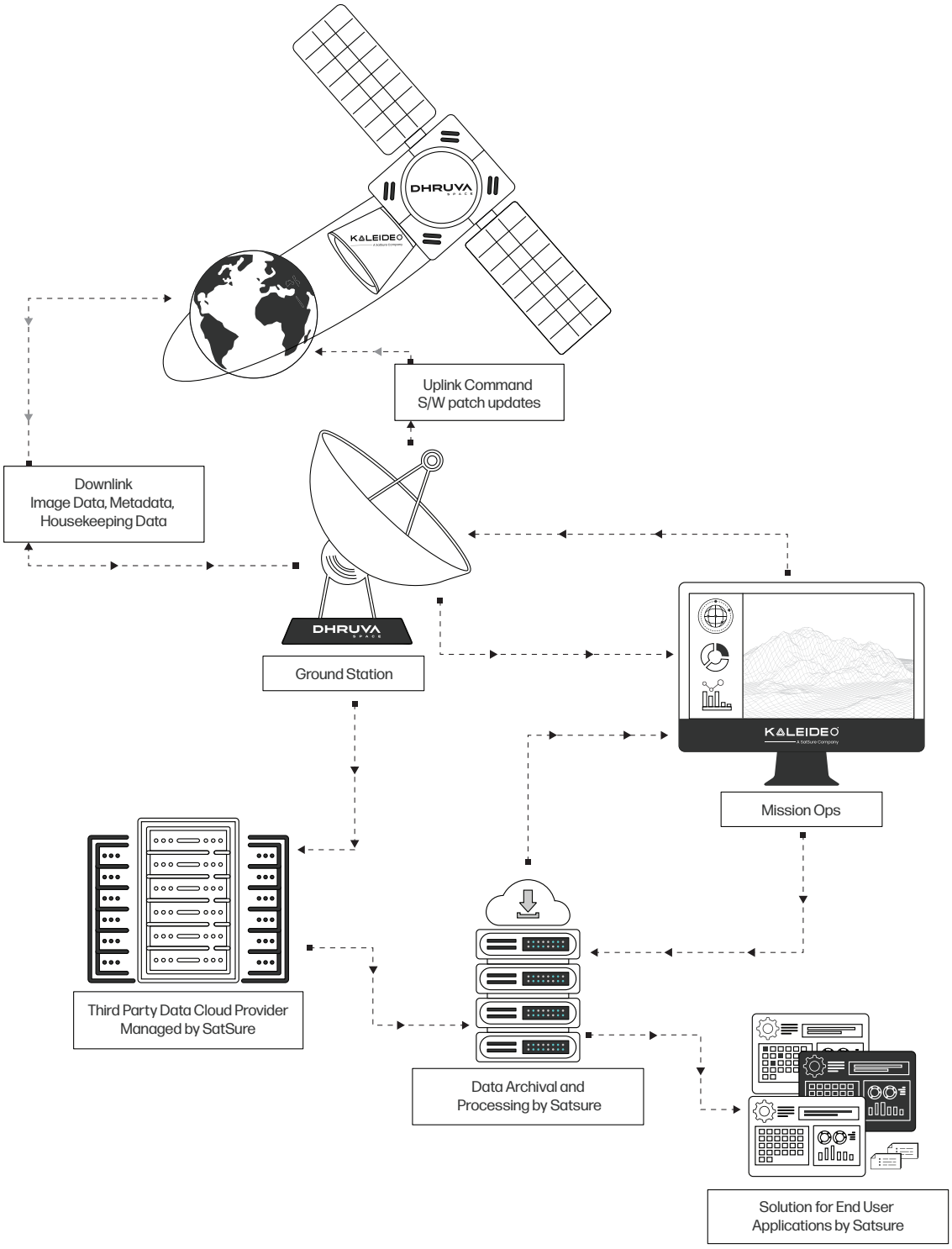
Despite growing access to EO data, many organizations struggle to convert raw satellite imagery into timely, actionable insights. The absence of scalable analytics frameworks and contextual decision layers continues to hinder the integration of geospatial intelligence into everyday planning, policy formulation, and operational response.

There is a critical need for an end-to-end EO Value Chain Solutions that delivers decision intelligence across industries — one that transforms EO data into industry-specific contextual, timely, actionable insights, preventing valuable information from becoming unused EO-data dust.

2. Solution Architecture

To address the systemic gaps in data access, technical capability, and actionable intelligence faced by emerging Space nations, Dhruva Space and SatSure are offering EOaaS, a comprehensive, sovereign framework designed to empower nations with end-to-end EO capabilities.

This customer-focussed approach accelerates the journey from raw data to actionable outcomes, fostering sustainable, independent Space programs without the need for decades-long development cycles.



2.1 Technology Stack

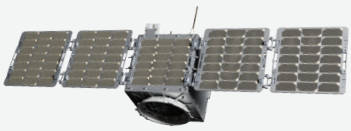
EOaaS is powered by a fully integrated, sovereign-capable technology ecosystem that spans satellite hardware, launch services, ground infrastructure, and advanced analytics.

Based on technologies developed by Dhruva Space, KaleidEO, and SatSure, this stack delivers high-resolution, near real-time geospatial intelligence tailored to the needs of emerging Space nations. This ecosystem ensures seamless, scalable, and secure EO capabilities for national security, urban planning, and disaster management, fostering strategic autonomy and operational resilience.

Space Segment

The Space segment comprises EO satellites, built on Dhruva Space's indigenously developed satellite platforms, integrated KaleidEO's advanced payloads including Optical payloads, while Synthetic Aperture Radar (SAR), Hyperspectral, and motherboard sensors can be incoporated through our partner ecosystem.

KaleidEO's optical sensors provide sub-meter resolution for urban and security mapping, while SAR ensures all-weather imaging for disaster response, and hyperspectral sensors offer spectral analysis for environmental insights. These systems maximise coverage with fewer satellites while incorporating edge computing capabilities for in-orbit processing, reducing downstream data burdens.



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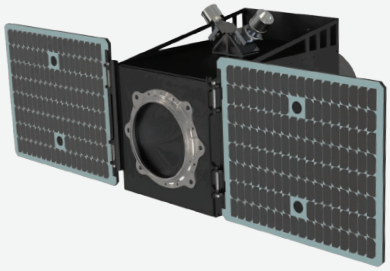
20 - 50 kg
MicroSat



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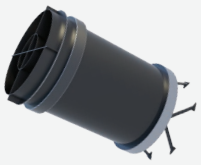


OPT 50

A 0.5 m High Resolution, Submeter Imager

- Designed for High Resolution Object Identification
- 11 km Swath
- 6 bands (R, G, B, NIR, RedEdge and PAN)
- Currently at TRL 3

OPT 120

A 1 m Multispectral, Wide Swath Imager

- Designed for Large Area Coverage
- 65 km Swath
- 9 bands (Red, Green, Blue, PAN, Red Edge-1, Red Edge-2, NIR, NNIR)
- Currently at TRL 6

Launch Segment

Dhruva Space's indigenously designed separation systems compatible with most international launch vehicles (GSLV, PSLV, Falcon 9, SSLV, Starship, etc) for the deployment of small satellites. These vehicles support a range of payload sizes and orbital parameters. These partnerships ensure reliable launch windows, aligning with mission-critical timelines and minimising delays.

Ground Segment

The Ground segment fosters robust data acquisition, processing, and mission control through a vast network of ground stations, built, on Dhruva Space's Ground Stations as a Service (GSaaS) model. In 2024, Dhruva Space was authorised by IN-SPACe, for GSaaS, enabling seamless TT&C (Telemetry, Tracking & Command) operations, near real-time data downlink, and cross-support for both domestic and international satellite missions through a scalable, cloud-integrated ground infrastructure.

Access to 13 ground stations across 10 countries, including strategic locations in India and Europe, supports TT&C and high-throughput data downlinking. X-band and S-band communications enable low-latency data transfer. Data feeds into scalable cloud-based frameworks for efficient storage, processing, and distribution. This reduces on-site hardware requirements, enabling cost-effective operations.

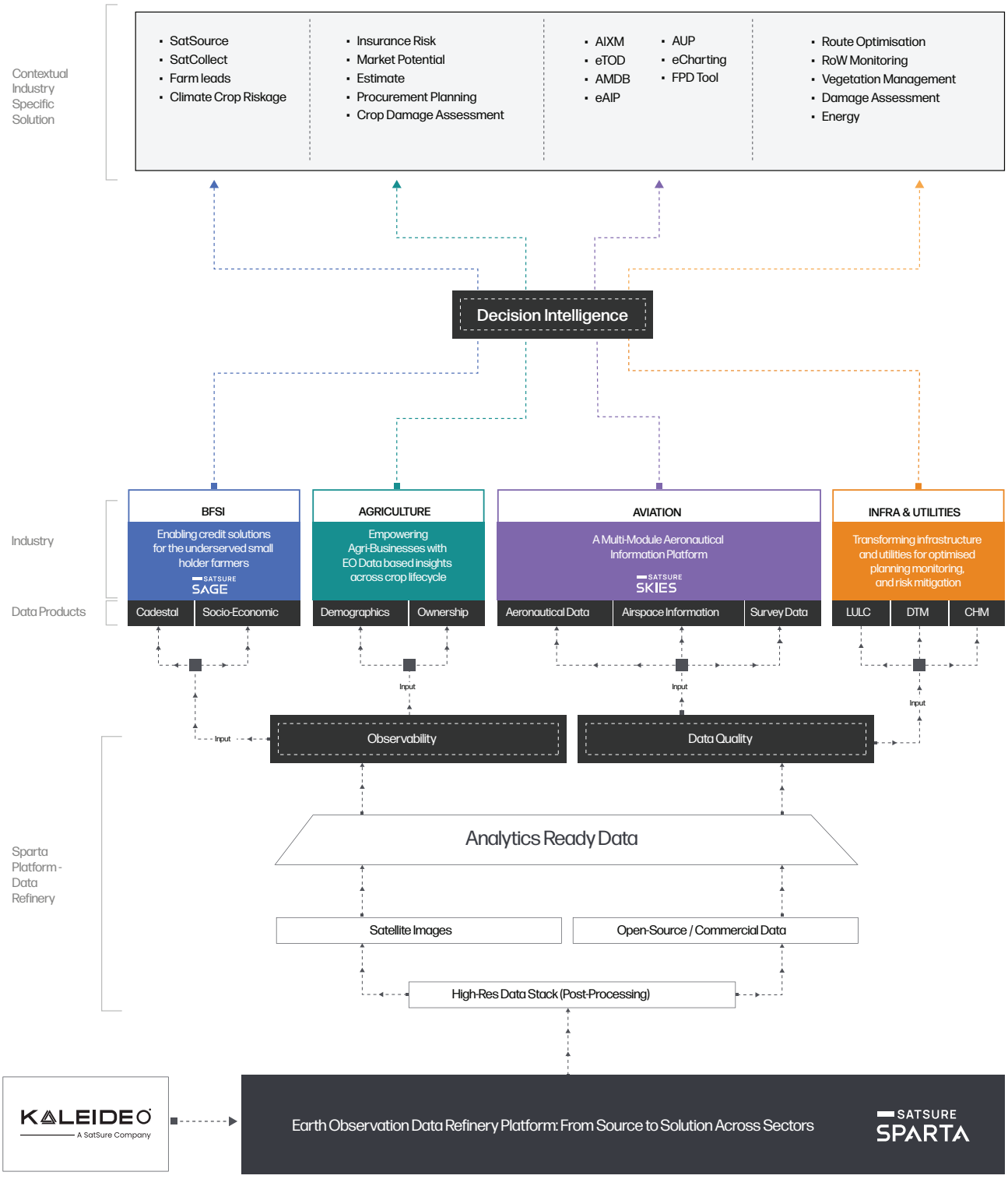
The distributed design minimises single-point failures, enhances data security, and supports continuous operations for real-time applications.

Analytics Layer

SatSure's analytics layer forms the foundation of its EOaaS offering. This layer is responsible for the heavy lifting – processing raw satellite data into structured, analysis-ready datasets, enriched through fusion with non-traditional sources like financial, agronomic, cadastral, weather, and demographic data.

Decision and Data Layer

The Decision & Data Layer operationalises the output from the analytics stack and ensures it reaches the right stakeholders in usable form. This is where SatSure excels in converting data into business value through tools, platforms, and integrations tailored for enterprise and government decision-makers.



2.2 EOaaS in Action

End-to-End Capacity Building

EOaaS is designed to streamline the establishment of robust EO ecosystems, enabling emerging nations to bypass resource-intensive research and development phases while building core competencies across the Space value chain.

Design, Development, and Deployment: EOaaS enables the rapid design, development, and deployment of bespoke satellite platforms, such as those indigenously designed by Dhruva Space, tailored to meet specific mission requirements and national development priorities. This approach significantly lowers the traditional barriers to entry for Space programs, empowering emerging nations and enterprises to establish advanced EO capabilities with speed and agility.

Building on this foundation, KaleidEO develops and integrates cutting-edge high resolution optical, multispectral EO payloads equipped with edge-AI capabilities – ensuring high-resolution, low-latency data collection optimised for downstream analytics.

SatSure, in turn, operationalizes this data by embedding it into enterprise-scale decision systems, enabling applications in agriculture, infrastructure, aviation, agri-credit lending, disaster response, and ESG monitoring. Together, this vertically integrated approach – from satellite build to decision impact – ensures not only faster deployment cycles but also a seamless translation of EO data into contextual, actionable insights that serve both national and commercial objectives.

In-Country Capability Development: EOaaS empowers local teams with expertise in key areas such as satellite operations and geospatial data analytics. These initiatives are structured to foster sustainable, in-house capacity, aligning with national development goals. SatSure brings its experience in building downstream applications across agriculture, utilities, aviation, and infrastructure to support tailored analytics training and the development of localized data products.

Customized EO Program Design: Modular, scalable solutions are tailored to national priorities, such as national security, urban management, and disaster response. By aligning with specific use cases, we ensure that EO programs deliver immediate value while supporting long-term objectives, and provide flexibility in ownership and operations, allowing nations to structure programs that best suit their strategic and financial preferences.

Asset Access

EOaaS provides seamless access to both orbital and ground infrastructure, eliminating the need for emerging Space nations to develop complex systems from scratch.

Orbital Infrastructure: Access to custom-built satellites equipped with optical, Synthetic Aperture Radar (SAR), and hyperspectral sensors, ensuring high-resolution data tailored to diverse applications. Dhruva Space's bespoke satellite platforms are complemented by KaleidEO's advanced payloads, which offer high-resolution, large-swath, multispectral imaging with improved signal-to-noise ratios and edge computing capabilities.

Ground Infrastructure: Our solution includes support for accessing ground stations for Telemetry, Tracking, and Control (TT&C), data downlinking, and storage. Dhruva Space provides access to 13 ground stations across 10 nations, enabling near-real-time data acquisition.

Data Analytics and Decision Tools

SatSure approaches this challenge by combining EO data with non-traditional datasets – including financial, demographic, cadastral, agronomic, and weather data – to build a multi-layered intelligence stack. This allows organisations to move from descriptive analytics (what happened) to predictive analytics (what will happen).

Key aspects of SatSure's data analytics layer and decision intelligence feature:

Scalable Infrastructure for Analysis: Built on cloud-native architectures, SatSure's analytics engine enables processing of massive EO datasets in near real-time, making it possible to deliver insights when they matter most – whether it's a crop failure risk alert or post-disaster infrastructure impact assessment.

Decision-Grade Models: SatSure develops and maintains sophisticated AI/ML models tailored to vertical-specific needs – be it agri-lending, utilities, infrastructure monitoring, or insurance underwriting. These models are trained on high-quality datasets and continuously updated with new EO and field-level inputs to improve accuracy and relevance.

Enterprise Workflow Integration: SatSure's tools are built with enterprise users in focus – not EO experts. Through informative dashboards, API integrations, and automation-ready formats, insights can be consumed directly into existing business processes such as SatSure Source Reports, SatCollect, SatSure Maps, or asset management dashboards.

Action-Oriented Visualisations: Visualisations translate spatial information into business KPIs and decision logic. SatSure's tools highlight anomalies, generate risk scores, and track performance metrics over time and geography, helping enterprises make confident, timely decisions.

Contextual Intelligence Delivery: Data is most useful when it speaks the language of the user. SatSure's decision intelligence platform is designed to deliver context-aware outputs – understanding whether a user is a policy maker, field officer, or financial analyst – and tailoring the data experience accordingly.

SatSure's data analytics and decision intelligence tools bridge the gap between satellite imagery and boardroom decision-making. They convert Space-based observations into enterprise-grade intelligence, supporting decisions that are not just faster, but smarter, more sustainable, and aligned with global development goals.

Training, Integration, and Sovereignty

SatSure's proprietary platform, Sparta, serves as a full-stack EO data refinery, delivering sector-specific decision intelligence. The platform interprets analytics in the context of the user – field officer, analyst, or policymaker – and tailors outputs accordingly. SatSure's vertically integrated Space-tech stack delivers contextual intelligence across agriculture, aviation, infrastructure, forestry, and utilities. Sparta is built to scale with diverse national priorities, ranging from Sustainable Development Goal (SDG)-aligned initiatives, from water resource planning to enabling near real-time alerts for disaster response.

By making geospatial intelligence accessible across government departments, financial institutions, and industrial sectors, Sparta supports the shift from fragmented, reactive monitoring to proactive, data-driven governance, achieved at lower cost, in shorter timelines, and aligned with global best practices.

3. Applications

Agriculture

Banking, Financial Services, and Insurance

Aviation

Infrastructure & Utilities

Forestry

Water & Urban Planning

The synergy between Dhruva Space, KaleidEO, and SatSure creates a fully indigenous, scalable EOaaS stack – redefining how Space-based intelligence is designed, delivered, and deployed at a global scale.

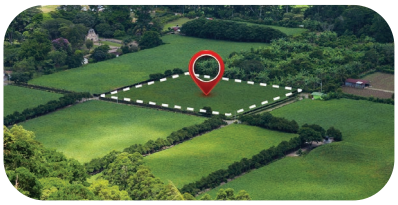
EO capabilities offer transformative solutions for emerging Space nations, addressing pressing challenges in national security, urban planning and infrastructure development, and disaster management and response. By delivering high-resolution, timely, and tailored geospatial intelligence, EO enables strategic decision-making, enhances resilience, and fosters sustainable development.

3.1 Scope of Services

From sourcing EO data to developing industry-specific solutions, SatSure's data product helps address unique challenges faced by sectors such as BFSI, agriculture, aviation, infrastructure, and utilities.

Climate Risk

- ☑ Risk Identification & Mitigation
- ☑ Predictive Analysis for Floods & Droughts
- ☑ Climate Hazard & Air Quality Modeling
- ☑ Surface & Groundwater Quality Assessment
- ☑ Fire & Agroforestry Vulnerability



Agri-Business

- ☑ Agri-Inputs: Seeds & Chemicals
- ☑ Agri-Commodities: Procurement Planning
- ☑ Carbon Credit: Plantation Mapping
- ☑ Partnerships: Multi-Laterals & FMCG

Aviation

- ☑ Gaps in Aerodrome Digitization
- ☑ Long Lead Times in Data Capture
- ☑ Manual & Error-Prone Validation
- ☑ Lack of Digital Data Management
- ☑ Siloed Critical Data, No Future-Ready Platforms

Forestry

- ☑ Deforestation & Forest Cover Mapping
- ☑ Ecosystem & Socio-Economic Assessments
- ☑ Health Monitoring: Canopy, Tree Cover, NDVI
- ☑ Carbon Credit & Forest Planning
- ☑ Digital Workflows for Projects

Agri-Insurance

- ☑ CCE Optimisation
- ☑ Climate Data for Insurance (ET, AQI)
- ☑ Crop Insurance: Claim Settlement & Monitoring
- ☑ Crop Damage & Yield Assessment

Infrastructure & Urban Planning

- ☑ Asset Detection & Land Cover Classification
- ☑ High-Resolution Elevation Models (DTM & DSM)
- ☑ Planning, Monitoring & Geocoding
- ☑ Building Footprint Identification

Utilities & Critical Infrastructure

- ☑ Power Transmission & Distribution, Optical Fibre
- ☑ Transmission Lines, Roads & Railways
- ☑ Route Optimisation & RoW Monitoring
- ☑ Vegetation Management & Feature Detection

Reinsurance

- ☑ Insurtech: Product Development and Claim Validation
- ☑ Parametric Insurance for Extreme Weather Events
- ☑ Flood & Drought Risk Models
- ☑ Insurance Provider Support

Water Resource Management

- ☑ Irrigation Automation & Precision Application
- ☑ Site Suitability: Watershed & Usage Analysis
- ☑ Rainwater Harvesting Potential
- ☑ Sustainable Water Efficiency & Scarcity Analysis

Disaster Management

- ☑ Damage Detection for Roads & Buildings
- ☑ Asset Detection & Counting
- ☑ Land Use & Land Cover Change Analysis
- ☑ Damage Calculation & Mapping

Agri-Banking

- ☑ Collection Insights: Monitoring & Weather-linked Insurance
- ☑ Climate Impact: ET & Air Quality Indicators
- ☑ Risk & Policy: SatSource Reports, Renewals
- ☑ Sourcing Intelligence: Cluster Ranking, Portfolio Monitoring

3.2 Real World Impact of Earth Observation

Cyclone Idai west of Madagascar, captured by Copernicus Sentinel-1

Cyclone Idai: Earth Observation Impact on Disaster Response and Recovery

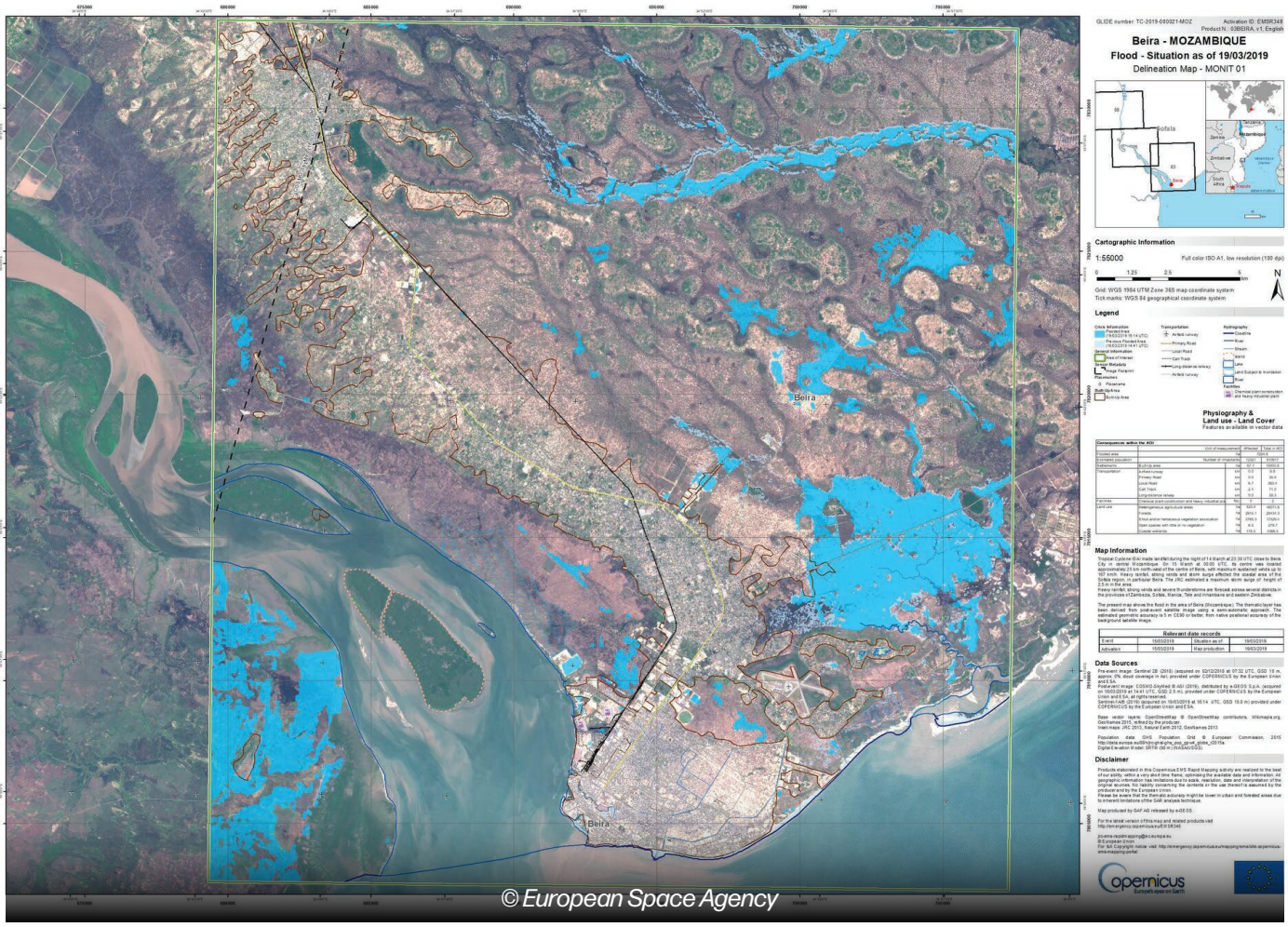
Tropical Cyclone Idai made landfall near Beira, Mozambique in mid-March 2019, causing one of the most severe weather-related disasters in Southern Africa's history with widespread flooding, infrastructure destruction, and massive humanitarian need across Mozambique, Malawi, and Zimbabwe. Tens of thousands of homes were flooded, infrastructure was severed, and over a million people were displaced.

EO Role and Application

Satellite Earth Observation (EO) data from systems such as Sentinel-1 and Sentinel-2 were applied for systematic mapping of flood extent and for post-disaster damage assessment. EO was used to generate accurate spatial information on inundated areas, verify infrastructure damage where ground access was limited, and track the extent of flooding across remote communities. These analyses supported situational awareness for responding agencies.

Technical Implementation

- Multi-temporal radar (SAR) and optical imagery (Sentinel-1 and Sentinel-2) were processed to distinguish water from land pre- and post-flood, enabling quantification of flooded zones and duration of inundation.
- Flood extent maps derived from EO offered granular detail on affected basins such as Pungue and Buzi rivers, highlighting areas under water for extended periods.
- EO-derived flood maps were integrated with other geospatial inputs to inform operational decisions about where humanitarian access would be most critical and how to allocate limited resources effectively.



Copernicus Sentinel-1 maps floods from Idai

Operational Impact

- EO enabled responders to assess flood severity and damage where roads and communications were compromised, ensuring evidence-based targeting of relief assets.
- EO data provided unbiased, high-coverage information that complemented limited ground reports, accelerating decision cycles for emergency support and longer-term recovery planning.

Outcome and Value

The use of satellite EO during Cyclone Idai demonstrated practical value by delivering timely and spatially comprehensive flood extent products that humanitarian agencies and national authorities could not obtain through in-situ surveys alone. This contributed to more informed prioritization of life-saving resources, informed assessment of infrastructure loss, and guided early recovery planning in a complex, high-impact disaster environment.

4. Business Delivery Model

EOaaS offers a structured, collaborative pathway for emerging Space nations to adopt and operationalise EO capabilities, ensuring alignment with national priorities and long-term sovereignty. This roadmap provides a phased, customisable approach to building robust EO ecosystems, from needs assessment to operational rollout, with a focus on scalability, capacity building, and strategic autonomy. By leveraging technologies developed by Dhruva Space and SatSure, the process empowers nations to rapidly deploy mission-critical solutions for national security, urban planning, and disaster management.

Needs-based Assessment and Strategic Alignment

The engagement begins with a comprehensive analysis of the customers' EO requirements, conducted in partnership with local stakeholders. This phase identifies priorities across national security (e.g., border surveillance), urban planning (e.g., land use mapping), and disaster management (e.g., flood prediction), mapping them to technical and operational needs. For example, assessing data latency requirements for disaster response ensures solutions address specific pain points.

Program Design

Based on the assessment, a modular EO program is designed, offering flexible models for satellites, ground stations, and analytics platforms. SatSure's APIs and Dhruva Space's modular satellite designs enable rapid customisation, ensuring solutions fit unique needs like maritime surveillance or urban expansion monitoring. This phase prioritises cost-effectiveness and scalability, accommodating nascent programs with limited infrastructure.

Technology Deployment and Integration

The deployment phase involves deploying hardware (satellites) and integrating software AI-driven dashboards, SpatioTemporal Asset Catalogs compliant.

Ground station access is deployed across strategically selected locations to minimise data latency and maximise coverage, while cloud-integrated frameworks reduce dependence on local infrastructure. Dhruva Space's GSaaS supports efficient satellite-to-ground communication and rapid data downlink, serving as a key enabler of scalable, near real-time EOaaS for mission-critical and distributed use cases. Integration with existing national systems, such as GIS platforms, ensures seamless adoption. This phase minimises operational complexity and accelerates time-to-value.

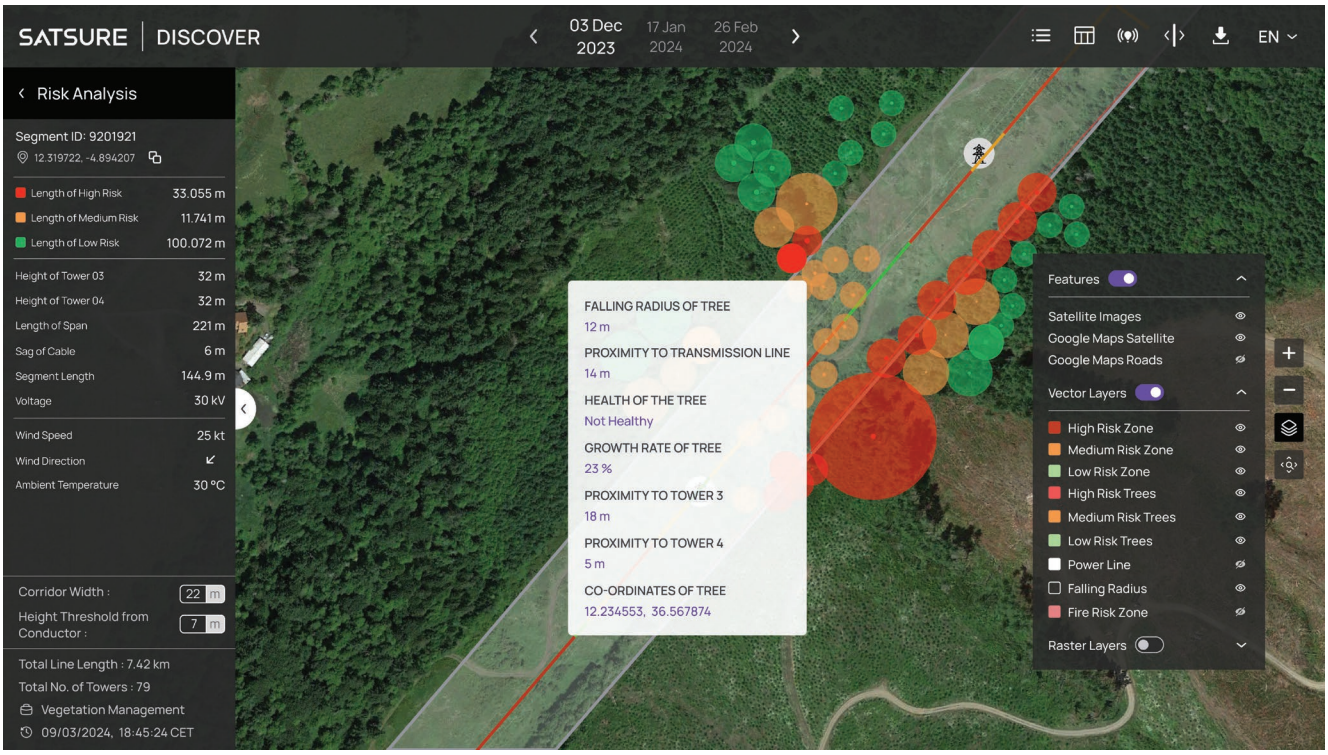
Operational Rollout and Evolution Pathway

Full operational rollout is supported by ongoing advisory services, ensuring seamless mission execution and data delivery. SatSure's proprietary analytics platform, Sparta, delivers sector-specific decision intelligence solutions. Whether applied to agri-lending, urban planning, or climate risk monitoring, Sparta enables end-users to access high-quality Earth Observation analytics without requiring deep technical expertise.

Capability Building and Knowledge Transfer

Structured training programs build in-house expertise in satellite operations, geospatial analytics, and mission management. Collaborative testing and joint operations, empower local teams to manage payloads and interpret data. SatSure enables enterprises to become self-reliant in Earth Observation through its structured, customer-centric capacity-building programs.

These programs go beyond basic training — focusing on building in-house expertise across satellite operations, geospatial analytics, and mission management. Customer-centric training ensures users can leverage analytics platforms like SatSure's Sparta for sector-specific insights. This phase fosters sustainable, independent EO capabilities, reducing reliance on external expertise.



SatSure's Analytics Dashboard

By embedding these tools into operational workflows and ensuring contextual training, SatSure ensures that EO adoption is not only effective but also sustainable and sovereign, significantly reducing long-term dependence on external providers.

A long-term evolution pathway includes regular technology updates, and scalability options to adapt to growing needs, such as expanding ground station networks or adding more satellites. This ensures EOaaS remains future-ready, supporting nations as their Space programs mature.

About

Dhruva Space

Dhruva Space is a full-stack Space Engineering solutions company based in Hyderabad, India, offering Satellite/s coupled with Earth Station/s and Launch Service/s as an integrated solution or individually as technology solutions to power Space-based applications for Defence and Civilian use.

Having built strong Space Heritage, Dhruva Space has launched 8 payloads across 4 launches with another 18 commercial satellite deliveries over 30 months, including Hosted Payload Missions series (LEAP-1), the first-of-its-kind to be launched in 2025 with global customers.

Dhruva Space has its own series of satellite platforms ranging from 0.5U up to 300 kg class, CubeSat and Ring Deployers for Small Satellites, Space-Grade Solar Arrays, Ground Station capabilities in the VHF to Ka Band and an integrated software suite for spacecraft operations, mission management.

SatSure

SatSure is one of the world's most comprehensive Earth Observation (EO) data refinery platforms. With capabilities spanning both downstream analytics and upstream satellite infrastructure through its wholly-owned subsidiary KaleidEO, SatSure delivers end-to-end EO solutions that are scalable, accessible, and operationally meaningful.

KaleidEO strengthens the EO ecosystem by developing high-resolution, multispectral EO payloads with edge computing capabilities. As an analytics-first payload innovator, it enables complete EO infrastructure—from satellite payload development and mission operations to data processing and delivery.

Together, SatSure and KaleidEO offer a full-stack EO capability, built in India for the world, empowering industries to make smarter, faster, and data-driven decisions.

Endnotes

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DHRUVA SPACE
SATSURE
KALEIDEO
A SatSure Company
A strategic alliance between Dhruva Space and SatSure delivers sovereign, scalable, and intelligent EO infrastructure tailored to national priorities and mission-ready deployment needs.