

Analysing the pattern dynamics in Earth Observation Research & Innovation

LAND COVER & INTELLIGENCE



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Introduction

In recent years, there has been an **increasing uptake of Earth Observation (EO)** as a tool in support of the implementation of various policies and the execution of a wide range of operational tasks. Users across the value chains of different sectors can utilise EO-based solutions in support of their work, **realising significant benefits** (economic, environmental, societal, etc.). Market demand for such solutions is driven by policies and sector-specific needs. Technological advances have the potential to enable solutions that match the specific needs.

EuroGEO, Europe's part of the Group on Earth Observation, stands at the intersection of research, policy, and markets. This **strategic position** allows it to identify and monitor relevant developments and trends, to engage stakeholders, and to assess the evolving EO landscape in Europe and beyond. Capturing insights relevant for the different stakeholders allows EuroGEO to document the current state of play of EO, its trajectory, and the required steps for broader adoption and increased benefits.

With the support of the [EuroGEOsec project](#), and with the aim of **maximising the impact of Research and Innovation (R&I)**, a dedicated effort has been made to establish the **R&I Observatory for Earth Observation (RIO)**. This includes a team of analysts and an online tool to monitor and analyse past and ongoing R&I in EO in order to identify trends and support strategic decisions on future R&I activities. Relying on the RIO, the so-called **R&I State-of-Play Reports** are created presenting a concise overview of the policy context, technological perspectives, and market trends within the thematic areas covered by the [EuroGEO Action Groups \(AG\)](#). This present report focuses on analysing patterns in the **Land Cover and Land Intelligence (LC&LI) segment**. Research has been complemented by multiple other reports and studies, including studies performed by and for EuroGEO's LC&LI AG.

The aim of this report is to **support EuroGEO and its stakeholders in decision-making** regarding future work programmes and strategic innovation agendas (such as those of the Knowledge Centre on Earth Observation – KCEO), inform the review of the **EuroGEO Implementation Plan**, and contribute to the production of institutional outputs.

The following EuroGEO **Action Groups** develop application pilots/conduct other actions foreseen in the EuroGEO roadmap: Agriculture, Land Cover and Land Intelligence (LC&LI), Urban, Disaster Resilience and Health, Energy, Biodiversity, ecosystems and geodiversity (BEG), Marine, Climate, and Green Deal Data Spaces.

Methodology

The browser-based tool of the **R&I Observatory for Earth Observation** (RIO) allows retrieving relevant information from a variety of sources, including project information (e.g., descriptions, partners, budgets, results, timelines) for the majority of relevant European R&I programmes. Sources include information related to e.g., Horizon Europe (HE) and its predecessors, the LIFE programme, the Connecting Europe Facility, Eurostars, COSME, the European Defence Fund, and the European Defence Industrial Development Programme. Additional sources are being incorporated as part of the continuous development of the RIO.

The RIO structures the information into a standardised format for the uniform documentation of R&I activities. Functions of search, bookmarking, filtering, visualisation, and export allow the processing and analysis of the pre-curated information.

The focus of the analysis is on **mapping R&I efforts across segments** by analysing data on projects, core applications, budgets, and timelines. The full list of the analysed projects, filtered from the database of projects and mapped against segment-specific EO applications can be found in the original deliverable [🔗](#). The segment's **core applications** have been identified and mapped based on the most prominent and important themes, as determined by the Action Group and its leads. They are derived from **AG expert studies** [🔗](#) and further validated by sector experts such as AG leads. See the classification below:

- Land Cover and Use Mapping
- Advanced Classification Technologies
- Change Detection and Monitoring
- Data Integration and Synergies
- Environmental Monitoring and Policy Support
- Environmental Crime Detection
- Validation and Nomenclature Harmonisation

To address the research questions – i.e., to identify trends in EO-related R&I for LC&LI applications and the drivers behind them – the following **limitations or simplifications** were applied:

Data Processing

- Project information sourced from the RIO (including acronym, title, coordinators, topic, programme, pillar, objectives, work programme, status, start and end dates, budget, grant, and links) has been filtered using segment-specific keywords to ensure that only relevant projects are included and no projects are overlooked. This relies on full-text search in existing descriptions and meta data, along with the use of consistent terminology. Where data might be missing or unexpected terminology is used, certain projects may have been missed.
- The filtered list of projects considered relevant has been extracted (i.e., exported into a spreadsheet) for processing.
- Data has been manually checked for relevance and further cleaned accordingly, then augmented by segment-specific categorisation for more detailed analysis.

Methodology

Timeframe

In order to restrict the analysis to relevant activities while drawing from a significant enough sample size, a (roughly) **10-year timeframe** is used, covering the period **from 2014 to 2024** (i.e., only projects that have started before 2025 and have not ended before 2014 have been analysed). This timeframe is used to capture long-term trends, technological developments, and measurable outcomes of concluded projects. It also ensures that typical project lifecycles, such as those in Horizon Europe, are included. It coincides with the launch of the first Sentinel-1 satellite in 2014, the free and open data of Copernicus being considered as one driver of EO-related R&I, which has been attempted to confirm through the analysis.

Sample Size

The sample data is limited to the sources **currently included in the RIO**, expected to cover relevant European R&I projects to a large extent, but with further potentially relevant projects not included in the analysis where the data source has not been included yet. It is further limited to the keywords and queries applied (see data processing above) and timeframe selected (see timeframe above).

Budget allocations per application

Breaking down budgets of projects that address more than one segment-specific application and dividing them across these applications has been done following a simplified approach assuming an (unlikely) even distribution. Therefore, budget sizes per application can only **reflect trends** and may not be fully accurate.

To interpret and complement the findings from the RIO tool, **desk research** has been conducted across reports and studies, including:

- European Space Agency (ESA) application or industry articles
- European Commission (EC) documents, e.g., Climate factsheets, Reports on uptake barriers of EU space services
- EUSPA EO and Global Navigation Satellite System (GNSS) 2024 Market Report
- Stocktaking Reports from related Group on Earth Observations (GEO) initiatives
- Horizon Europe's Strategic Research and Innovation Agendas
- Segment-specific as well as EO-related strategic research and innovation agendas including outcomes of the Horizon 2020 (H2020) project *FIRE*
- EuroGEO Workshop Reports
- [EuroGEO LC&LI AG Expert Study](#)

These **sources** were carefully reviewed to extract relevant content that addressed the questions raised during the analysis. They were particularly useful in identifying gaps and barriers in each segment, as well as R&I trends and technologies that are (or can be) applied to address these issues.

LC&LI Overview

Land cover is a key type of Earth Observation (EO) data, providing a consistent view of the Earth's surface. In the past twenty years, global EO has evolved rapidly due to expanding satellite constellations, cloud-based processing, machine learning advances, and growing demand for detailed environmental insights. Europe has led this change, mainly through the Copernicus Programme, the world's largest source of open EO data and land monitoring products [🔗](#).

The EO market is growing, with data and value-added services rising from **€3.4 bn in 2023 to nearly €6 bn by 2033**, driven by applications in climate, agriculture, insurance, and urban development. Europe accounts for over **20% of global EO demand**, boosting its industrial and institutional role [🔗](#).

The LC&LI segment in Europe faces strong regulatory pressures. The **EU Green Deal**, **2030 Biodiversity Strategy**, **LULUCF Regulation**, **CAP**, and **EUDR** require systematic land monitoring, verification, and reporting. The revised LULUCF Regulation, for example, sets a **-310 Mt CO₂eq net removal target by 2030**, demanding improved land monitoring and modelling. CAP rules also require precise field-scale land use data, increasingly supported by automated classification and change detection with Copernicus Sentinel-1 and -2.

These policies drive demand for reliable LC/LU mapping, change detection, standardized classifications, reference datasets, and validated automated products – core elements of LC&LI. The LC&LI Action Group also notes growing user needs for “certification of automatically classified land products” and “crosswalks between classification systems” to ensure interoperability and trust [🔗](#).

Current EO solutions address many of these challenges. Sentinel-1 SAR supports change detection, biomass estimation, and hazard monitoring, while Sentinel-2 optical imagery focuses on land cover and ecosystem assessments. Sentinel-3 monitors biophysical variables and climate indicators. Complementing these, Copernicus Land Monitoring Service (CLMS) products – **CORINE Land Cover** [🔗](#), **High-Resolution Layers (Tree Cover and Forests and Imperviousness)** [🔗](#), **CLCplus Backbone** [🔗](#), and **Ground Motion Service** [🔗](#) – are vital for environmental reporting and decision-making [🔗](#).

These capabilities directly support the report's application categories: Land Cover and Use Mapping, Advanced Classification Technologies, Change Detection, Data Integration, Environmental Monitoring, Environmental Crime Detection, and Validation & Harmonisation.

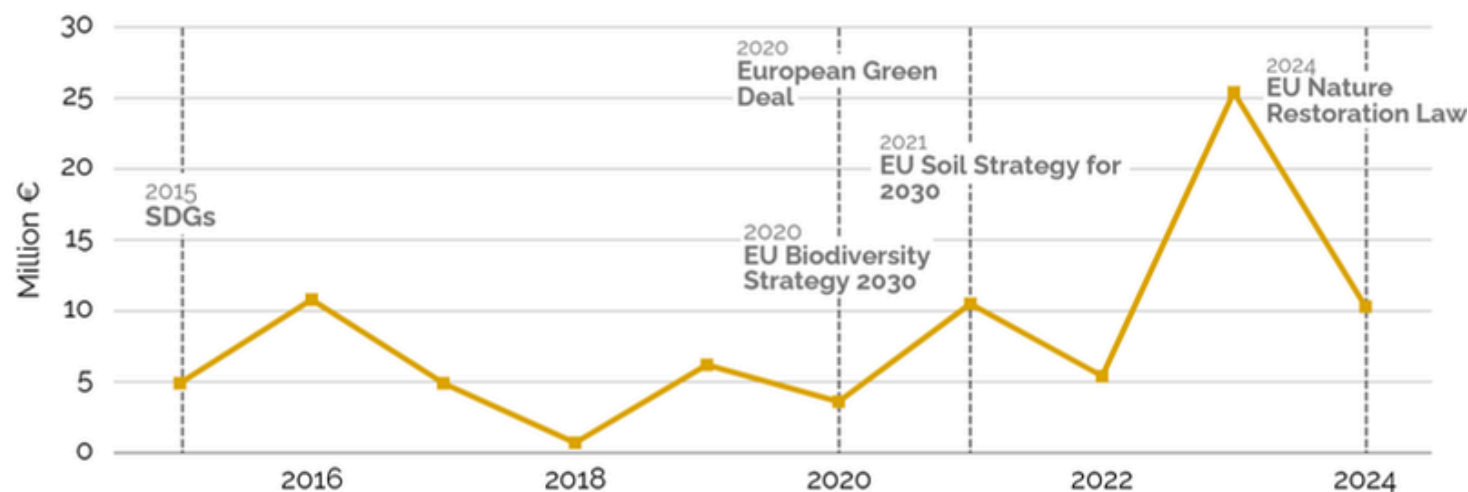
Global strategic priorities are shifting toward **Earth Intelligence**, highlighted in the **GEO Post-2025 Strategy**, which calls for: (1) co-production of actionable intelligence; (2) integration of emerging technologies like AI/ML and digital twins; (3) strengthened open EO infrastructures; (4) equity and inclusion; and (5) next-generation EO innovators. These align closely with LC&LI and EuroGEO's objectives [🔗](#).

Overall, the LC&LI segment sits at the intersection of regulatory pressure, technological innovation, and EO's shift to decision-ready intelligence, driving growing demand for accurate, timely, and reliable land information across Europe.

Policy Context

Land cover and land intelligence (LC&LI) constitute important components for a wide range of environmental, climate, agricultural, biodiversity, and urban policies. As land cover **information supports the monitoring of nearly all terrestrial processes**, European and international policies increasingly rely on such information to **guide planning, assess environmental performance, and fulfil reporting obligations**. This has been a major driver for a rise in Earth Observation (EO) related R&I activities (as illustrated in the graph below, generated with the help of the R&I Observatory – RIO), which are progressively expanding the capabilities, accuracy, and usability of LC&LI solutions.

Fig. 1: Evolution of EO R&I LC&LI Budget (€M) and Key Policy Shifts



Satellite-based LC&LI datasets are essential for **identifying and quantifying changes** in land use, ecosystem condition, soil health, urban expansion, agricultural practices, and terrestrial carbon fluxes. With the maturation of EO data (quality, quantity, and utilisation) and the increasing integration of AI and machine learning into **automated land-cover classification workflows**, LC&LI have become central enablers across multiple policy domains, from climate neutrality to biodiversity restoration, sustainable agriculture, disaster resilience, and compliance monitoring.

The **European Green Deal (EGD)** makes land systems crucial for climate neutrality, biodiversity protection, pollution reduction, and sustainable resource use. LC&LI is central to several EGD strategies. The **EU Biodiversity Strategy for 2030** seeks to protect 30% of EU land, restore degraded ecosystems, limit land take, and improve ecological connectivity – tasks that rely on harmonised LC datasets to map habitats, assess degradation, and track restoration (e.g., wetlands, peatlands, forests). The **EU Nature Restoration Law** mandates legally binding restoration targets, with Member States submitting National Restoration Plans by 2026, using EO to monitor baselines, progress, and reporting. The **EU Soil Strategy for 2030** and **Soil Monitoring Law** aim for harmonised soil health assessment, requiring LC&LI data to track soil sealing, degradation, erosion risk, and soil organic carbon, driving demand for integrated EO-based soil monitoring workflows.

The land sector is central to achieving Europe’s **climate goals**. The **European Climate Law** creates the legal basis to achieve climate neutrality by 2050. This is supported by a number of policies and regulations: The **LULUCF Regulation (EU) 2018/841** and its **2023 revision** sets binding targets for carbon removals in land-use and forestry sectors. Member States must monitor emissions and removals across land-use categories, making accurate land-cover and change-detection products essential for annual reporting, MRV (Monitoring, Reporting and Verification), and national greenhouse gas (GHG) inventories. The **2030 Climate Target Plan** and **Fit-for-55 Package** create EO demand for assessing land-based mitigation measures, forest condition, land-take, urban green infrastructure, and nature-based solutions. The **Paris Agreement** requires transparent accounting of land-based emissions and removals. EO-derived land-cover data support GHG monitoring, deforestation assessments, and long-term land-climate modelling.

Policy Context

Further, several **agricultural and rural policies** depend directly on land-cover information. The **Common Agricultural Policy (CAP) 2023–2027** [↗](#) includes eco-schemes, conditionality measures, and on-farm environmental monitoring requirements that rely on LC&LI classification for **compliance checks**. The **Nitrates Directive** [↗](#), **Water Framework Directive** [↗](#), and the **Sustainable Use of Pesticides Directive** [↗](#) require monitoring of agricultural land use, soil sealing, riparian changes, and crop practices. LC&LI information enables catchment-scale assessment, nutrient-risk mapping, and land-management auditing.

The **EU Deforestation Regulation (EUDR)** [↗](#) mandates geolocation of commodity production areas and the demonstration that no deforestation or land degradation has occurred since 2020. This places unprecedented demand on high-resolution land-cover **change detection** and **automated classification workflows**.

Additional policy drivers exist in the context of urbanisation pressures. The EU **Zero-Pollution Action Plan** [↗](#) and the **soil sealing monitoring requirements** of the Soil Monitoring Law depend on accurate characterisation of built-up areas, impervious surfaces, and green infrastructure. The **EU Territorial Agenda 2030** [↗](#) and the no-net land take 2050 goal of the EU Soil Strategy for 2030 require high-quality land-cover products to track urban expansion, assess land take, and monitor drivers of fragmentation.

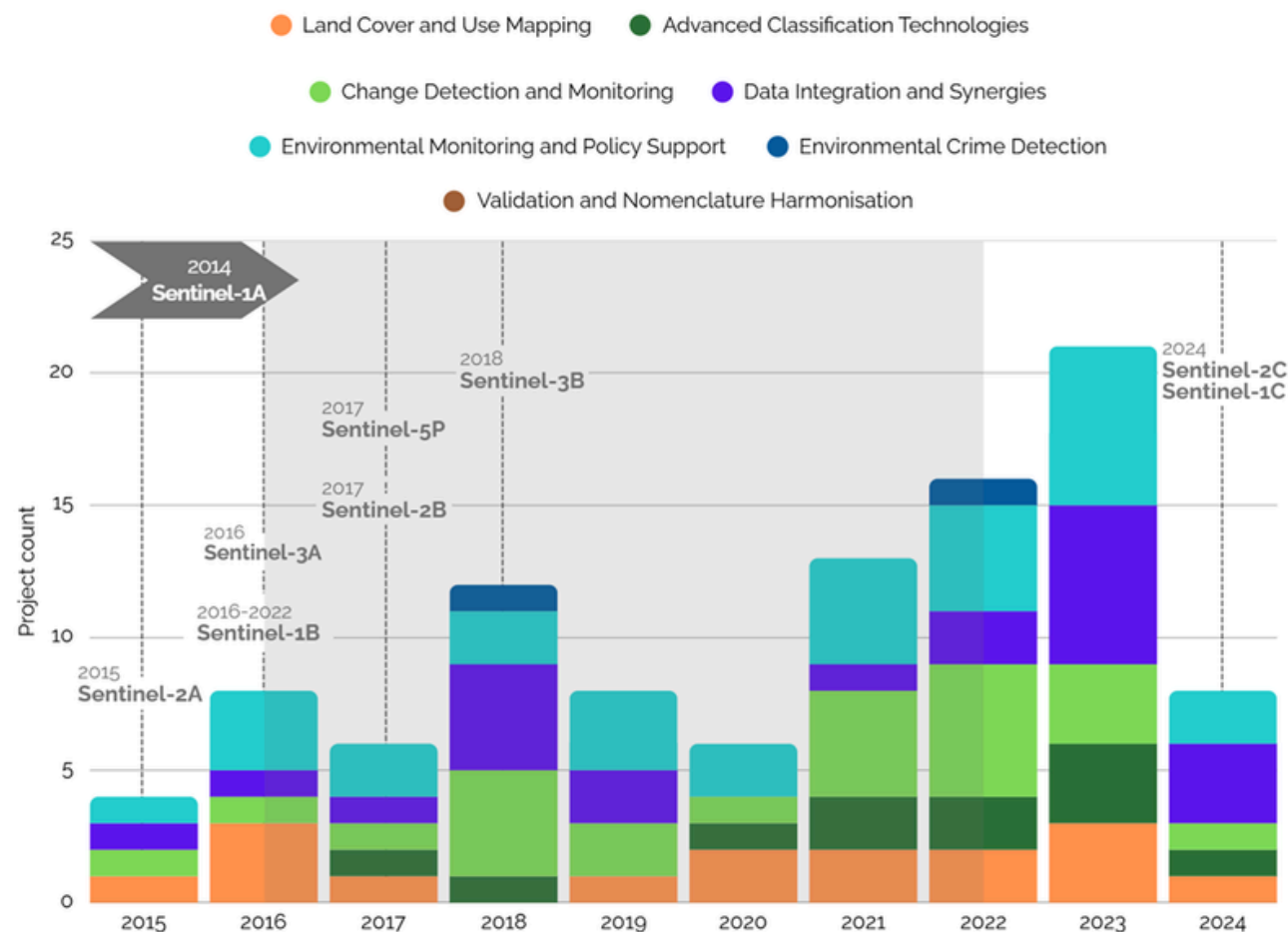
LC&LI are also central to several major global policy frameworks. They support **UN Sustainable Development Goals (SDGs)** indicators for land degradation [↗](#), sustainable cities [↗](#), climate action [↗](#), and food security [↗](#). The **UN Convention to Combat Desertification (UNCCD)** [↗](#) relies on land-cover and land-productivity monitoring for Land Degradation Neutrality (LDN) targets. And the **Convention on Biological Diversity (CBD)** [↗](#) and **Kunming–Montreal Global Biodiversity Framework** [↗](#) require land-cover information to track habitat change, ecosystem integrity, and restoration progress.

Given its cross-cutting relevance, LC&LI sits at the centre of multiple strategic policies. This creates a **growing demand** for robust, trustworthy, application-ready land-cover **datasets** and advanced land **intelligence methodologies**, precisely the focus and value proposition of the EuroGEO LC&LI Action Group.



Technological Perspectives

Fig. 2: LC&LI Project Count Timelines by Application & Sentinel Missions



The LC&LI segment is technologically more mature compared with many other EO segments, benefitting from over a decade of Copernicus Sentinel operations and the longstanding use of CORINE Land Cover and CLMS products across Europe. Most workflows now integrate **Sentinel-1 SAR**, which provides all-weather, day–night change detection, with **Sentinel-2 MSI**, a multi-spectral instrument to capture high-resolution images. Sentinel-3’s ocean, sea, and land colour and temperature instruments (OLCI and SLSTR) further support biophysical variable retrieval, while in situ and aerial datasets fill resolution gaps for local monitoring.

The Copernicus Land Service supports LC&LI efforts by providing the CLC and CLCplus backbone for harmonised land cover mapping across Europe, which consist of high-resolution layers covering features like impervious surfaces, water bodies, forests, grasslands, wetlands, and small woody features, as well as the Ground Motion Service for monitoring geophysical processes. These **CLMS products** are explicitly identified in the LC&LI AG study as essential **reference layers** that support automated classification, change detection, training dataset generation, and data integration workflows.

The evolution of R&I projects (2015–2024, Figure 2) reflects growing EO data maturity. Sentinel-1A (2014) and Sentinel-2A (2015) were pivotal, driving major increases in LC&LI projects from 2016 onward.

According to the analysed project listing, there has been recurring activity in **Land Cover & Use Mapping** since 2015, peaking in 2023 (3 projects) – potentially consistent with institutional demand for CLC/HRLs updates and agricultural monitoring. **Change Detection & Monitoring** is the strongest growth area, rising from 1 project in 2015 to **5 projects in 2022**, driven by Sentinel-1’s systematic SAR acquisitions. **Advanced Classification Technologies** shows a clear upward trend, reflecting broad adoption of ML/AI and cloud-based workflows. **Environmental Monitoring & Policy Support** remains consistently strong, peaking in 2023 (6 projects) and linked to EU Green Deal policies. **Data Integration & Synergies** grows sharply post-2018, aligning with policy needs for cross-domain indicators, ecosystem accounting, and climate-land interactions.



Technological Perspectives

Environmental Crime Detection remains niche but strategically important. **Validation & Nomenclature Harmonisation** appears under-represented – as no projects in the analysed dataset addressed such application, confirming the gap identified in the LC&LI AG study. [🔗](#) This pattern shows that technological maturity – especially the continuity of Sentinel missions and cloud-based access through **DIAS** and the **Copernicus Data Space Ecosystem** – has directly boosted research activity, innovation, and market adoption.

Several EU initiatives further strengthen LC&LI capabilities. Destination Earth (DestinE) is creating high-resolution digital twins of the Earth, offering unprecedented modelling of land processes, hazards, and climate-ecosystem interactions. **Copernicus expansion missions** [🔗](#) – such as CHIME, LSTM, ROSE-L, and CIMR – directly support LC&LI applications, while the **Copernicus Thematic Hubs** for Coastal, Arctic, Energy, and Health improve access to integrated, domain-specific datasets, closely aligned with the GDDS Action Group’s priorities. The Green Deal Data Space (GDDS) has also been highlighted as a key mechanism for ensuring interoperability and enabling cross-sector data fusion. [🔗](#)

However, despite significant progress, several key challenges remain in the LC&LI segment. **Standardised frameworks** for validating and certifying automated land cover products are still lacking, and harmonisation of land cover and land use nomenclatures is limited, limiting cross-border and cross-dataset integration. Reference datasets for training and validating AI and machine learning models at a continental scale remain limited, near-real-time change detection is still underutilised despite Sentinel-1’s frequent revisits, and the integration of socio-economic data differs across Member States.

Looking ahead, several technologies are set to strengthen LC&LI. AI, DL, and ML – already applied in projects like GeoAI_LULC_Seg, RapidAI4EO, and EVOLAND – will continue to improve automation and accuracy. Hyperspectral imaging from LSTM feeds into vegetation and soil indicators, while L-band SAR from ROSE-L will enhance biomass estimation and forest monitoring. DestinE will integrate EO data and modelling to support scenario analysis, and quantum computing could help tackle large-scale optimisation and classification challenges. [🔗](#)

These developments collectively position the LC&LI segment for increasingly precise, timely, and trusted environmental intelligence.

Fig. 3: Budget Distribution for EO-Related R&I in Land Cover and Land Intelligence



The market for land cover and land intelligence (LC&LI) is seeing **expansion** as environmental regulation, sustainability reporting, and digitalisation drive the demand for spatial information. EO is becoming a **mainstream information source** for environmental monitoring, agriculture, forestry, climate adaptation, and urban planning, all of which require reliable information related to land cover and land use. This broad adoption is reflected in global EO market forecasts, which anticipate steady growth in environmental and land-focused applications over the next decade.🔗

A major driver of this growth is the **increasing need** for authoritative **land-cover and land-use mapping**, which **at least 16 EO-related projects** active during the analysed period have been addressing with combined budgets of **more than €8m**. Regulatory frameworks such as the EUDR require economic operators to verify the land-use history of production areas, creating a **large and legally mandatory market for geolocation-based land-cover verification**. Public authorities preparing climate, biodiversity, soil, and restoration reporting similarly depend on harmonised LC datasets at national and regional scales. At the same time, private-sector actors in e.g. agriculture, forestry, and finance have begun to integrate land-use intelligence into their risk assessment and sustainability processes🔗. These developments have made LC mapping one of the most consistently demanded EO services globally.

Further, the market shows an increase of automated land-cover extraction and **advanced classification techniques**. Deep learning, convolutional neural networks, and cloud-native processing environments are key capabilities of the commercial and research-driven LC production ecosystem. Modern satellite missions generate data volumes that exceed the capacity of manual interpretation. Cloud platforms (e.g. Google Earth Engine, Microsoft Planetary Computer, Copernicus DIAS) have made it feasible to perform large-scale classification, enabling frequent and rapid updates, higher spatial consistency, and near-real-time processing. Value is increasingly created through **automation**, timeliness, and analytical sophistication rather than through the imagery itself. During the analysed period, at least **11 EO-related projects** addressed advanced classification techniques with combined budgets of about **€3.5m**.

Market Trends

A related and rapidly growing segment is continuous **change detection**. Many environmental and socio-economic processes, including deforestation, land degradation, urbanisation, or agricultural expansion, require monitoring at frequent temporal intervals. Global Forest Watch, for instance, has documented a surge in demand for near-real-time forest-loss alerts among governments, NGOs, and supply-chain actors [🔗](#). Climate-risk assessments by international financial institutions rely on land-change indicators to evaluate exposure to drought, erosion, or flooding. At the national level, monitoring obligations associated with climate mitigation, adaptation planning, disaster-risk reduction, and nature restoration all require temporal datasets that can detect change across seasons and years. **23 EO-related projects** have been active during the analysed period addressing **change detection and monitoring**, with combined budgets of about **€10m**.

Another trend in LC&LI is the growing focus on multi-source data integration. Environmental governance increasingly combines satellite EO data with in situ sensors, socio-economic data, cadastral parcels, citizen-science inputs, and more. European initiatives like the Green Deal Data Space [🔗](#), Common Agricultural Data Space [🔗](#), and Destination Earth (DestinE) [🔗](#) reflect a **shift toward integrated information ecosystems**, with land cover as a foundational layer. International organisations, including OECD [🔗](#) and UNEP [🔗](#), stress that effective environmental and climate policies require **interoperable data infrastructures** linking EO, ground observations, and administrative datasets. This is illustrated by **31 EO-related projects** in the analysed period, with combined budgets of **nearly €23 m**.

Rising environmental regulations, reporting frameworks, and policies drive demand for LC&LI products **supporting monitoring and policy**. European Green Deal elements – Nature Restoration Law, Soil Monitoring Law, Biodiversity Strategy, and LULUCF Regulation – require consistent, verifiable land data. National obligations for climate mitigation, adaptation, ecosystem assessment, and agricultural subsidies **rely on comparable geospatial indicators**. Globally, countries increasingly use EO for natural-capital accounting and to meet UNFCCC, CBD, and SDG commitments. Harmonised, validated, policy-ready land-intelligence products are thus central to environmental monitoring. This long-term regulatory demand underpins a stable LC&LI market and fosters innovation in automated mapping, change detection, and integrated reporting. During the analysed period, **29 EO-related projects** with combined budgets over **€30 m** addressed environmental monitoring and policy support.

There is also growing use of LC&LI solutions for environmental compliance and enforcement. Organisations like Europol [🔗](#) and UNODC [🔗](#) identify **environmental crime** – illegal logging, unlicensed mining, unlawful land conversion, and waste dumping – as **one of the fastest-growing criminal sectors worldwide** [🔗](#). Many such activities leave spatial signatures **detectable** via satellite monitoring. For the analysed period, **two EO-related projects** on environmental crime detection were identified, with combined budgets of around **€4.5 m**.

The LC&LI market is steadily expanding as regulations, sustainability reporting, and digitalisation drive demand for reliable, timely land information. Users are shifting from static maps to automated, integrated, and regularly updated intelligence services for policy, supply-chain verification, and environmental risk management. LC&LI is thus central, with ongoing innovation in classification, change detection, and data harmonisation essential to meet evolving needs.

Using the RIO as a source, we identified key stakeholders driving R&I in EO solutions for LC&LI to assess uptake and awareness maturity. Academia is the dominant group, followed by Small and Medium-sized Enterprises (SMEs).





Projections

Looking ahead, the evolution of LC&LI will be shaped by the convergence of policy requirements, technological advances, market growth, and rising user expectations. Policy demand is set to continue growing, driven by the Green Deal, restoration targets, LULUCF reporting, and compliance requirements under CAP and EUDR. These policies require more detailed, frequent, and interoperable land information. This directly supports the growth of applications such as **change detection**, **data integration**, **environmental monitoring**, and **LC/LU mapping**.

On the technology side, the rise of AI/DL/ML, new Sentinel missions, and DestinE will accelerate the shift from EO data to **operational Earth Intelligence**. As the GEO Post-2025 Strategy emphasises, EO will become more user-driven, co-produced, and integrated with socio-economic datasets, supporting early warning, nature-based solutions, land degradation monitoring, and ecosystem accounting.

Market projections reinforce these dynamics, as EO value-added services are expected to grow at ca. **6% CAGR**, reaching almost **€5bn by 2033**.[🔗](#) The most relevant areas to LC&LI, e.g. Climate, Agriculture, Urban Development, Infrastructure, and Insurance, have high revenue and growth potential.

LC&LI applications are expected to expand into **automated land cover mapping** with annual updates, near-real-time change detection for compliance monitoring, and integrated environmental indicators supporting climate adaptation, biodiversity, and nature-based solutions. AI-driven anomaly detection, including applications in **environmental crime**, is set to become increasingly prominent, alongside the growth of cross-domain digital ecosystems.

Overall, the segment is expected to shift from producing maps to delivering **predictive, policy-aligned, and interoperable intelligence**, powered by open EO and advanced analytics.

EuroGEO Contribution

According to the LC&LI AG Expert Study, the Action Group acts as a “technology-agnostic, cross-cutting enabler” that strengthens access to high-quality, trustworthy, application-ready land information. [🔗](#)

EuroGEO supports the LC&LI segment by fostering **collaboration** among **Member States, SMEs, researchers**, and domain **experts**, promoting consistent naming conventions, classification crosswalks, and harmonised standards, and encouraging the exchange of best practices for validation and certification. It also drives innovation through joint projects, workshops, and partnerships, while contributing to cross-AG synergies in areas such as Biodiversity, Climate, and Disaster Risk Reduction. The EuroGEO Workshop 2024 further emphasised the importance of the **Green Deal Data Space**, digital **interoperability**, and strengthening regional communities to ensure that data, models, and services are discoverable and reusable across policy domains. [🔗](#)

EuroGEO can leverage its impact by leading the development of **pan-European validation frameworks** for automated land cover products, supporting the co-production of indicators with users in line with GEO’s Post-2025 priorities, and promoting open, harmonised LC/LU nomenclatures and reference datasets. It can also bring together contributions from Copernicus, DestinE, and Member State initiatives into a coherent digital ecosystem, while nurturing early-career innovators and SMEs through targeted calls and capacity-building efforts. EuroGEO should align its future efforts with these priorities to maximise impact, by supporting scalable, automated workflows, trusted and interoperable continental-scale datasets, cross-domain integration for policy and climate services, and innovation pipelines that bridge research and operational applications.

Glossary

| | |
|--------------------|---|
| AG | Action Group |
| AI | Artificial Intelligence |
| CAGR | Compound Annual Growth Rate |
| CAP | Common Agricultural Policy |
| CBD | Convention on Biological Diversity |
| CEF | Connecting Europe Facility |
| CHIME | Copernicus Hyperspectral Imaging Mission for the Environment |
| CIMR | Copernicus Imaging Microwave Radiometer mission |
| CLC | CORINE Land Cover |
| CLMS | Copernicus Land Monitoring Service |
| CO ₂ eq | Carbon Dioxide Equivalent |
| DIAS | Data and Information Access Services (Copernicus cloud platforms) |
| EEA | European Environment Agency |
| EGD | European Green Deal |
| EO | Earth Observation |
| ESA | European Space Agency |
| EUDR | EU Deforestation Regulation |
| EuroGEO | Europe's regional initiative within the Group on Earth Observations |
| EuroGEOsec | EuroGEO Secretariat project |
| GDSD | Green Deal Data Space |
| GHG | Greenhouse Gas |
| HRLs | High-Resolution Layers |

| | |
|--------|--|
| LC&LI | Land Cover & Land Intelligence |
| LC/LU | Land Cover / Land Use |
| LSTM | Land Surface Temperature Monitoring (Copernicus mission) |
| LULUCF | Land Use, Land Use Change and Forestry Regulation |
| ML | Machine Learning |
| MRV | Monitoring, Reporting and Verification |
| MSI | MultiSpectral Instrument |
| n | Sample size indicator in figure captions |
| OECD | Organisation for Economic Co-operation and Development |
| OLCI | Ocean and Land Colour Instrument |
| R&I | Research and Innovation |
| RIO | R&I Observatory |
| ROSE-L | Radar Observatory System for Europe – L-band mission |
| SAR | Synthetic Aperture Radar |
| SDGs | Sustainable Development Goals |
| SLSTR | Sea and Land Surface Temperature Radiometer |
| SMEs | Small and Medium-sized Enterprises |
| UNCCD | United Nations Convention to Combat Desertification |
| UNEP | United Nations Environment Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNODC | United Nations Office on Drugs and Crime |
| WP | Work Package |



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Disclaimer: This report is submitted as a final version for deadline purposes but remains **pending review by the LC&LI Action Group**. Revisions may follow based on their expert feedback.



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