Bridging Big Data From Space Down To Earth: Exploring Eo Integration In Eu Local Authorities

BiDS Conference

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Elisa Filippi, PhD Candidate DNOT

SAPIENZA
UNIVERSITÀ DI ROMA

NATIONAL PHD IN EARTH OBSERVATION

Research design: background

STRATEGIC CONTEXT

Credtis: Esa

EU's increasing investment in Earth Observation (**Copernicus 5,6 billion** euro 2021-2027)
Investment in the new **IRIDE** EO constellation (**1-billion-euro** Italian NRRP)
EO satellite data potential recognized as strategic to improve local public policies (UNOOSA 2019, JRC KCEO 2025)

Reports from the EU Court of Auditors (2021) and Industry (Earsc 2023) suggest persistent underutilization of EO data by LRAs

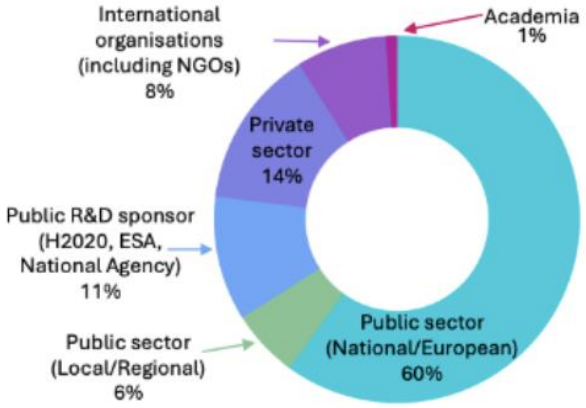


***Figure 20:** Companies' main customer types*

Earsc Industry report 2023

The Research Questions

RQ1: What are the key technological, organizational, and environmental factors influencing EO data adoption in European local and regional authorities (LRAs)?

RQ2: How do LRAs perceive the affordances (enabling features) and constraints (barriers) of EO data use in their operational and planning processes?

Survey design: **26- questions survey**

Technology Affordances and Constraints Theory (TACT) (Majchrzak & Markus, 2013) to assess the perceived benefits and limitations of EO technologies.

Technology–Organization– Environment (TOE) (Tornatzky & Fleischer, 1990) [6] to identify organisational and environmental conditions influencing adoption

3 more sections: organisation's background, EO usage patterns, Barriers/enablers and peer advice.

Data collection

A purpose-driven sampling strategy: LRAs engaged in EU-funded projects related to EO, climate adaptation/mitigation, or smart cities.

A total of **45** LRAs identified, mostly cities or urban-level actors.

DATA COLLECTION

So far, **25** fully completed responses from **17 EU Countries.**

1/3 Cities, Metropolitan Cities, Local/Regional Agencies.

EO USAGE PATTERNS

56% of respondents currently use EO directly
(14 Yes, 7 Only indirectly, 4 no or I don't know)

However, degree of usage **remains limited:**

Table n. 3 Degree of EO data usage by LRAs surveyed (N=14)

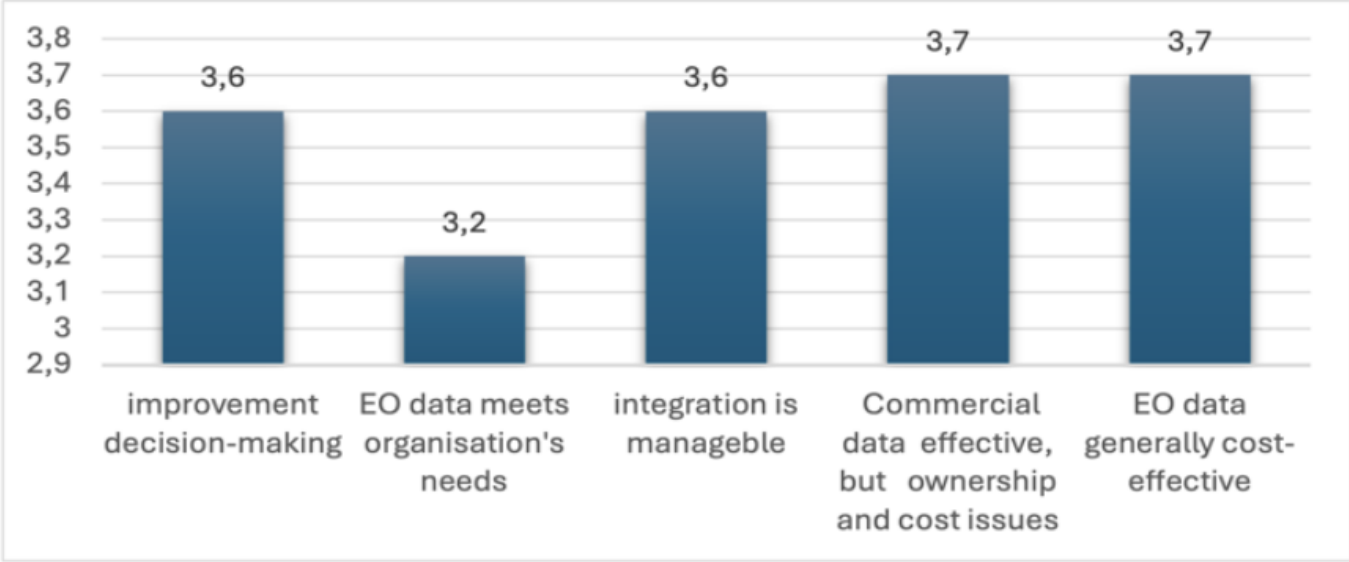
Level of EO usage	Description	Respondents (N)
Level 1	Tested experimentally	5
Level 2	Used occasionally for specific projects or reports	7
Level 3	Regular use in workflows	1
Level 4	Institutionalized use	1

Copernicus programme is the main data provider used by LRAs

Most **common application areas**:
Urban heat island monitoring; Land use and land cover change; Urban planning

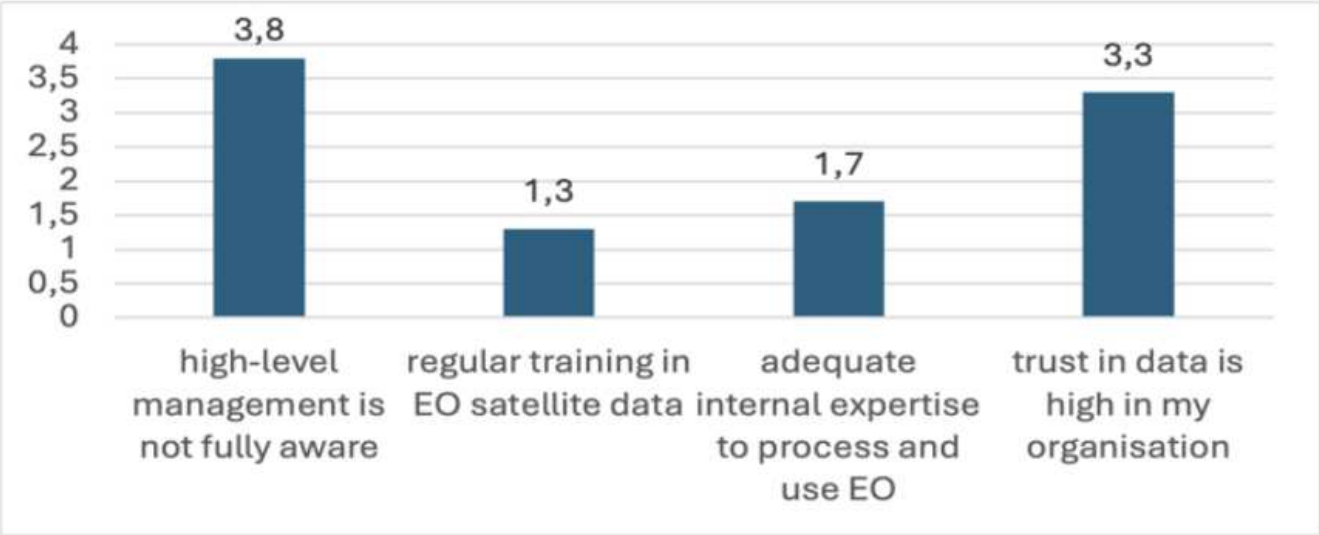
Technology affordances and constraints

Figure n.1 Respondents' agreement (5-point Likert scale) on five statements reflecting EO satellite data affordances and constraints. Values represent average values across eight EU LRA respondents directly using EO technologies.



TOE – Influential factors

Figure n.2 **Respondents' agreement (5-point Likert scale) on four statements reflecting organisational factors.** Values represent average scores across respondents N=12.



Perceived Barriers

Table 2. Main perceived barriers to EO data adoption among surveyed LRAs (N = 14)

Barrier	(N)
Lack of properly trained staff	12
EO data does not fully meet operational/knowledge needs	6
Limited budget	6
Complexity of the technology	5
Complexity of procurement	3
Lack of top-management/ legal inputs	2

Perceived Drivers

Table 3 Main perceived drivers fostering the adoption of EO satellite data among LRAs surveyed using EO data. (N=8)

Driver	(N)
Participation in a specific project or initiative	7
Organisation's internal need	6
Collaboration with a university or research institution	3
Strong commitment from leadership	3
Effective collaboration with an industrial service provider	2
Availability of funding from an EU programme	1
My own individual awareness or motivation	0
Legal or regulatory requirements	0

Peer to Peer Recommendations

Table n.4 Peer-to-peer recommendations among LRAs surveyed (N=8)

Recommendations	(N)
Invest in internal training for staff	6
Establish partnerships with research centers or universities	5
Collaborate with an industrial service provider to develop tailored solutions	3
Raise awareness and secure commitment from political/institutional leadership	3
Build direct cooperation with ESA or the National Copernicus Users Forum	3
Allocate appropriate funding within the ordinary budget	2

Thank you very much for your attention!

Elisa Filippi

elisa.filippi@uniroma1.it