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From satellites to services: Financing Earth observation for public value

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Earth observation (EO) – the collection of satellite data on the Earth's surface, waters and atmosphere – delivers public value to the EU and its partner countries. EO-enabled services translate observations into actionable information for climate planning, response and accountability, disaster risk management, food security and wider security applications.

While the EU and other international donors have supported investments across the EO service chain, this paper diagnoses four reasons why many EO solutions stall after pilots; 1) they are often financed as time-bound projects rather than as long-term services; 2) a payer-beneficiary mismatch exists, whereby public agencies or intermediaries pay, while citizens and smallholders benefit, creating fragmentation between demand and procurement; 3) gaps occur in terms of enabling-infrastructure and capabilities – e.g. connectivity, hosting, data governance – that raise unit costs; and 4) an 'OPEX tail' means that services must remain operational while budgets, mandates and renewal routines are still being built.

The key is to design credible payment and contracting architecture for multi-year services. The paper proposes three bankable operating archetypes: (1) an anchor tenant, where a public buyer contracts an EO-enabled service; (2) an intermediate aggregator, where a commercial or semi-commercial intermediary pays and bundles EO into an existing business model; and (3) a regional utility, where shared backbone capabilities lower fixed costs and support downstream service delivery. Lastly the paper offers a practical toolkit. It shows how support should be sequenced over time, matches financial instruments to each archetype, and presents time-limited support to bridge the gap between project funding and durable long-term ownership.

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Acronyms

EC	European Commission
AfSA	African Space Agency
ASEAN	Association of Southeast Asian Nations
B2C	Business-to-consumer
B2B2C	Business-to-business-to-consumer
CAPEX	Capital expenditure
CNES	Centre National d'Études Spatiales
COPERNICUS	European Union Earth Observation Programme
DFI	Development Finance Institution
DG INTPA	Directorate-General for International Partnerships (European Commission)
EFSD+	European Fund for Sustainable Development Plus
EIC	European Innovation Council
EO	Earth observation
ESA	European Space Agency
G4AW	Geodata for Agriculture and Water
GMES	Global Monitoring for Environment and Security
MUIIS	Market-led User-owned ICT4Ag-enabled Information Service
MRV	Monitoring, Reporting and Verification
NDICI	Neighbourhood, Development and International Cooperation Instrument
NSO	Netherlands Space Office
OECD	Organisation for Economic Co-operation and Development
OMVS	Organisation pour la Mise en Valeur du fleuve Sénégal
OPEX	Operating expenditure
SAED	Société d'Aménagement et d'Exploitation des terres du Delta (fleuve Sénégal)

SLA Service Level Agreement

Glossary

Term	Definition
Anchor tenant	A public authority or mandated agency that aggregates demand and signs a multi-year service contract, creating a single credible counterparty and a recurrent payment stream.
Intermediate aggregator (B2B2C)	A commercial or semi-commercial intermediary that pays at portfolio-level and embeds EO-enabled services into an existing product or channel (finance, insurance, agribusiness, utilities), so end users benefit without paying directly.
Regional utility	A shared regional capability that provides enabling infrastructure and common services (data access, hosting, reference layers, interoperability, core analytics) that multiple countries or agencies can use through defined governance and service tiers.
Service procurement (vs "project mode")	Treating EO-enabled delivery as an operational capability purchased and renewed over time (with service levels and accountability), rather than a time-bound project with a fixed end date.
OPEX tail	The recurrent operating cost period after pilots and early deployment, when the service must run reliably but the long-term payer, budget line, and procurement routines are not yet secured.
Service window	A time-limited bridging mechanism designed to keep a service operational while the pathway to a durable payer and renewal logic is established, with explicit milestones and an exit path.
Payment triggers	The contractual basis for payment (what must be true for money to flow), ideally tied to what the supplier can control (service availability and performance) rather than to downstream demand.
Default scenarios	Pre-agreed "what happens if…" cases that define responsibilities and remedies when predictable failures occur (for example budget interruption, infrastructure failure, governance breakdown).
Availability-style payments	Payments linked to the service being available and meeting agreed performance requirements, shifting risk away from demand volatility and toward delivery performance.
Capability absorption	The ability of the buyer and users to operationalise the service over time through routines, skills, staffing, governance, and contract management.
Data governance	Rules and routines for access, consent where relevant, transparency, auditability, and portability, so services can be trusted and sustained.

Executive Summary

Earth observation (EO) can be described as the systematic production of information about the Earth, drawing primarily from satellite measurements and, where relevant, complementary in situ sources. In this report, the focus is on EO in its operational use: a service capability that turns observations into decision-ready products for public workflows. Under this framing, EO-enabled services contribute to public value by improving the timeliness, targeting and accountability of public action.

As part of the Global Gateway strategy, the EU positions digital connectivity and data-enabled services as strategic infrastructure underpinning resilient and sustainable development and the delivery of public services. EO-enabled services provide actionable information for planning, response, and accountability and can thus support Global Gateway priorities related to climate and related areas, such as disaster risk management, food security and wider security applications.
Within the EU's external action framework, notably NDICI-Global Europe as the financing vehicle for Global Gateway, EO is increasingly integrated as an enabling capability to support policy design and decision making in partner countries.
The EU and Team Europe support partner countries across the EO service chain through a combination of capacity building, service development, and enabling infrastructure, using different delivery and financing modalities. This support takes several forms.

- **Grant funded programmes** that finance services and applications through consortia, including regional initiatives such as the Global Monitoring for Environment and Security and Africa (GMES & Africa).
- **Contribution agreements and technical cooperation** that help establish operational service capabilities and platforms, including support linked to the Copernicus Latin America and the Caribbean (CopernicusLAC) centres and Copernicus for the Philippines (CopPhil).
- **Investments in enabling infrastructure** that reduce structural barriers to uptake, including cloud-based access and mirror site type solutions designed to lower the cost of data access, processing, and connectivity for public agencies and service providers.
- **Financing tools combined with technical assistance**, including EU guarantees and blended finance instruments such as EFSD+, and adjacent innovation financing mechanisms such as European Innovation Council (EIC) blended finance for scaling companies where conditions allow.

Taken together, this landscape shows that the EU/Team Europe is putting in place key building blocks across multiple parts of the service chain. Yet, across many partner contexts, EO-related benefits remain constrained by a recurrent tension: EO-enabled solutions are often financed as time-bound projects, while the public value they are expected to generate depends on sustained service delivery. The core challenge is therefore a transition gap from funded demonstrations to recurrent service financing. This gap is driven by a persistent payer beneficiary mismatch, where those who benefit are rarely those able to pay, and where potential payers such as public agencies, insurers, and value chain intermediaries often lack clear budgetary and procurement pathways to sustain services. It is reinforced by critical cost drivers that sit beyond data access, notably last-mile delivery and human intermediation, enabling infrastructure such as connectivity and compute, and the long-time horizons required for institutional adoption compared to typical project cycles.

To address this transition gap, the report focuses on deal structures that make two conditions explicit from the outset: a credible payer and a pathway to sustained service delivery that accounts for the full-service chain, including enabling infrastructure and long-term operations. It proposes three bankable operating models that help meet these conditions. The first is an **anchor tenant model**, where a public agency commits to a multi-year service arrangement and procurement pathway. The second is an **intermediate aggregator model**, where a bank, insurer, or value chain intermediary bundles EO-enabled services into a broader offering and becomes the payer. The third is a **regional utility model**, where demand and capabilities are pooled through a shared service provider to reach scale and reduce unit costs.

Building on the three archetypes, the priority for DG INTPA and Team Europe is to enable credible payer pathways and recurrent service financing, so that EO initiatives move from funded demonstrations to sustained service delivery. This translates into six priority actions:

1. **Shift from funding stand-alone pilots to financing service continuity**, by supporting transition mechanisms that de-risk the OPEX tail and enable multi-year service delivery.
2. **Strengthen budgetary and procurement pathways for service level commitments**, including service-based contracting approaches where appropriate, so that recurrent payments can be institutionalised.

3. **Invest in enabling infrastructure where it is a binding constraint**, notably connectivity, compute and data access solutions, to reduce structural barriers to uptake and operations.
4. **Align financial instruments to the three archetypes and their risk profiles**, using guarantees, blending and other tools only where they are anchored in a credible payer and contract.
5. **Support deal preparation and implementation capacity**, including contract design, verification approaches proportionate to MRV capacity, and risk allocation provisions that anticipate default scenarios.
6. **Institutionalise learning and scale pathways**, by embedding evaluation, handover planning and regional knowledge hubs to move beyond one-off projects.

1. Introduction

1.1 EO and public value, key definitions

Earth observation (EO) refers to information derived from observing the Earth, primarily through satellites, complemented where relevant by in situ measurements, and processed into usable products and services. In this report, the focus is not on EO as data alone, but on its use for decision making in policy and operational settings.

EO-enabled services are the operational services that translate EO data into decision ready information and integrate it into institutional workflows. They typically combine data, processing and analytics, delivery channels, and user support, and they require continuity over time to remain reliable for planning, preparedness, and response, and to deliver public value.

In this report**, public value** refers to the collective benefits generated when EO-enabled services support public action and public service delivery, including risk reduction, resilience, compliance, transparency and accountability, where benefits are widely shared and not fully captured through direct commercial revenues. This usage is consistent with the way European Union institutions describe EO as serving the benefit of citizens (EC, 2019) and, more broadly, as a global public good enabling equitable partnerships and sustainable development, in line with the Global Gateway emphasis on delivering lasting social and economic benefits through partnerships grounded in governance and transparency (EC, n.d., Global Gateway).

In practice, EO-enabled public value services include, for example, early warning and risk information systems for disaster management, agriculture and food security advisory services, and land and water monitoring to support planning, compliance and accountability.

For EU cooperation with partner countries, this means that creating public value from EO requires not only access to data, but also enabling infrastructure and institutional pathways that allow services to be adopted, financed and sustained.

1.2 EU and Global Gateway baseline and relevance

The Global Gateway frames EU partnerships as a values-based offer that aims to deliver lasting social and economic benefits through high standards, transparency and sustainable investments (EC, n.d., Global Gateway). In this approach, digital

connectivity and data-enabled services are treated as strategic infrastructure that underpins public service delivery and resilience in partner countries.

EO-enabled services fit this logic because they provide decision ready information that supports policy design, targeting, preparedness and accountability. The EU's external action framework, notably NDICI Global Europe, provides the main financing vehicle for this engagement, while Copernicus provides an enabling EO infrastructure through its free and open data policy (EC, 2019).

In practice, the EU and Team Europe support EO-related services through a portfolio of interventions across the service chain, including grant funded programmes, contribution agreements and technical cooperation, investments in enabling infrastructure, and financing tools that can be combined with technical assistance. This portfolio is reflected in a set of flagship and programme level initiatives, including GMES and Africa, the Africa EU Space Partnership Programme, CopernicusLAC under the EU LAC Digital Alliance (notably the Panama and Chile centres), and Copernicus for the Philippines (CopPhil), alongside transversal programmes such as ClimSA that strengthen climate service value chains (EC, 2022).

Against this baseline, the rationale for this study is a recurrent limitation: many EO-enabled solutions are financed as time-bound projects, while the public value they are expected to generate depends on sustained service delivery (NSO, 2022). This creates a practical need to identify financing approaches that can support the transition from demonstration funding to recurrent service finance, and that can clarify who pays, through which channels, and under what conditions services can be sustained.

The scope of this report is therefore to identify financing models and instrument combinations that enable EO-enabled services delivering public value to move from demonstration funding to sustained service delivery in partner country contexts. It focuses on the pathway to recurrent service finance, including budgetary and procurement channels and, where appropriate, risk sharing and blended approaches, rather than on EO technology choices.

1.3 Methodology and sources

This report combines interview-based insights with a targeted review of publicly available literature and programme documentation. It draws on 45 semi-structured interviews with stakeholders involved in EO-enabled services for public value,

including public institutions, development partners and private sector service providers. The interviews were used to surface practical constraints, risk perceptions and deal-level considerations that are not always captured in published sources.

These insights were then triangulated through an evidence base drawing on policy and programme documents, evaluations and selected academic and grey literature. This evidence base was used to anchor key claims, clarify where findings are supported by external sources and distinguish interview-based perceptions from evidence-backed findings where needed.

This report draws primarily on EU-supported and related initiatives implemented in partner countries (e.g., Africa and Southeast Asia) and comparable "last-mile" service portfolios. While some findings may be generalised beyond these settings, the diagnosis and operating models are grounded in partner-country implementation environments.

Two caveats apply: first, some findings are context dependent and should be interpreted as indicative rather than universal. Second, where market dynamics are mentioned based on interviews but are not systematically mapped, they are framed cautiously and kept distinct from claims anchored in published evidence.

1.4 Structure of the report

This report is structured to support practical decision making on financing EO-enabled services for public value. Section 2 provides the market diagnosis and explains why current approaches often underperform beyond pilots, including the payer-beneficiary mismatch and the cost drivers that shape the sustainability gap. Section 3 sets out three bankable operating models that clarify who pays, how services are delivered, and what conditions make recurrent financing feasible. Sections 4 and 5 translate these insights into an implementation logic and an instrument menu aligned to the operating models, culminating in a set of recommendations for DG INTPA and Team Europe.

The overall objective is to support Global Gateway-aligned market creation: identifying where targeted public support can reduce early-stage risk, transaction costs, or verification burdens in order to catalyse durable EO-enabled service markets beyond project cycles.

2. Market Diagnosis: why current approaches fail to scale

At a glance: EO service value chain and stakeholders

EO for public value is delivered through a service chain in which roles and incentives are distributed across multiple stakeholder groups (Moretta et al., 2023; Sawyer et al. 2022).

- **Upstream actors** include space and data infrastructure providers, including Copernicus and other satellite data providers, as well as intermediaries that provide access pathways, cloud and compute capacity, storage and processing environments.
- **Midstream actors** include service developers and integrators who translate EO data into operational services, often combining EO with other datasets, analytics, delivery channels and user support.
- **Downstream actors** include public institutions and public agencies that use EO-enabled services for planning, preparedness, enforcement and accountability, as well as sectoral intermediaries such as insurers, financial institutions, value chain operators and utilities that may embed EO-enabled services into broader offerings.

Section 2.1 to 2.4 examine the main constraints along this chain, including payer architecture, procurement and renewal, hidden delivery costs, enabling infrastructure and the project-to-operations transitions.

2.1 The payer-beneficiary mismatch

Many EO-enabled services that generate public value face a structural payer-beneficiary mismatch. The primary beneficiaries are often citizens, smallholders, or communities, while the entities able to contract and pay are typically public agencies or intermediaries. This weakens market signals and makes willingness to pay difficult to translate into sustainable revenue streams, even when the social returns are high (NSO, 2022; Ifejika Speranza et al., 2023). The presence of value alone does not guarantee the presence of a payer.

In practice, this mismatch is reinforced by fragmented demand across ministries and agencies, limited budgetary space for recurrent service costs and procurement practices that are better suited to one-off projects than to multi-year service delivery (Cerbaro et al., 2020; Filippi and Aiello, 2024; Lages et al., 2023). It also helps explain why B2C models are often ill suited in low-income contexts, and why

sustainable EO for public value typically requires an institutional payer and a contractable service mode (NSO, 2022).

Several interviewees, particularly private EO service providers as well as public agencies and development partners, noted that even where a use case is widely recognised as valuable, the absence of a clear institutional mandate and budget owner can delay adoption and procurement beyond typical project timeframes.

The central question, therefore, is how to move from demonstration funding to recurrent service finance by making institutional payment pathways credible over time, including through appropriate budgetary and procurement channels.

Box 1: Payer-Beneficiary mismatch in last-mile delivery: the GEOPOTATO pivot (Bangladesh)

The limits of direct-to-consumer (B2C) models for dispersed smallholders are illustrated by GEOPOTATO in Bangladesh (2016-2019), an EO-enabled alert service for late blight disease in potato farming. The initiative was initially funded through the Netherlands' G4AW facility (administered by the Netherlands Space Office, NSO) led by Wageningen Plant Research, and implemented through a public-private consortium (including mPower and Terra Sphere) with national dissemination partners.

The service initially relied on a subscription model in which farmers were expected to pay around €2 per season. Despite initial expectations, implementation revealed a structural payer-beneficiary mismatch: affordability constraints, low digital familiarity and the high cost of acquiring and renewing individual subscriptions made the model financially fragile relative to revenues.

To sustain delivery, the project decoupled the beneficiary from the payer. The model pivoted to a B2B arrangement in which an agro-industrial (Bayer) pays the service provision, bundling farmer alerts within a broader commercial offer. In this configuration, farmers remain the intended beneficiaries, but recurrent payment is carried by an actor with the incentive and ability to contract and pay, illustrating why last-mile public value services often require a payer distinct from end users.

Source: (NSO, 2022; NSO, 2024)

Box 2: Institutional fragmentation and the need for an anchor public buyer: Copernicus Philippines (CopPhil)

Copernicus for the Philippines provides a concrete illustration of how fragmented public mandates can slow adoption pathways for EO-enabled services. Launched in January 2023 (initially structured as two years of pilot service development followed by a final year focused on "mainstreaming", later extended), this EU-supported programme aims to strengthen Copernicus uptake in the Philippines by combining enabling infrastructure, pilot services and adoption support. It is implemented through a European consortium working with national counterparts, with the Philippine Space Agency (PhilSA) and the Department of Science and Technology (DOST).

Early implementation highlighted how overlapping mandates and dispersed decision rights across ministries and agencies can undermine a clear contracting and renewal pathway. Implementers describe a "maze" of sector-specific jurisdictions, where responsibilities for crop, land information, disaster risk functions and EO data access sit in different entities. In practice, this meant that even when multiple agencies could benefit, only a limited subset had the mandate and internal coordination capacity to engage consistently. The result was slow convergence towards a contractable service scope and diluted accountability for sustaining delivery beyond the pilot phase.

Source: Expert interviews with programme stakeholders, 2025-2026.

2.2 The transition challenge: from pilots to recurrent service finance

A recurring challenge identified across EO for public value is the transition from pilot and demonstration funding to sustained service delivery. Many EO-enabled solutions prove technical feasibility and generate early results during project phases, but struggle to secure recurrent financing once initial grants end (NSO, 2022; Esendi and Munjua, 2019; Lages et al., 2023). This "transition gap" is not primarily a technology problem. It reflects the difficulty of converting a time-bound project logic into an institutional service logic with a clear payer, a budget line or procurement pathway and predictable operating finance.

Several factors reinforce this transition challenge:

- Funding is often structured around short project cycles and deliverables, while service sustainability requires longer time horizons for institutional adoption, including governance arrangements, staff capacity, integration into workflows, and recurrent funding decisions.
- Pilots frequently finance set up costs and early delivery, but do not establish the contractual and budgetary mechanisms needed for continuation, leaving service providers with an "OPEX tail" that remains unfunded once project finance ends.
- Because benefits are often diffuse and cross-sectoral, responsibility for paying can remain contested, and financing can fall between institutions even when the public value case is strong.

This dynamic was widely raised in interviews as a common failure mode: solutions are repeatedly demonstrated, yet services remain dependent on successive projects rather than becoming routine parts of public service delivery. The core question is therefore designing a credible pathway from pilots to recurrent finance, including payment architectures that allocate roles, risks and performance obligations over time.

Section 2.3 unpacks the cost drivers and risk factors that shape this sustainability gap, including the hidden cost of the last-mile, enabling infrastructure needs and the mismatch between project cycles and institutional adoption timelines.

2.3 The structural limits of the current approach

Stakeholder perspectives highlight a recurring "pilot trap", in which EO initiatives demonstrate technical feasibility during project cycles but do not translate into sustained service delivery once external funding ends. Several factors reinforce this transition challenge:

Structural limits of direct-to-consumer models in low-income markets
Affordability constraints and limited ability to pay at the last-mile make direct B2C models fragile, even when the social and economic benefits of services are widely recognised. Evidence from the G4AW portfolio[1] suggests that direct B2C payment by

[1] The Geodata for Agriculture and Water Facility is a grant programme funded by the Dutch Ministry of Foreign Affairs and executed by the Netherlands Space Office (NSO). Between 2013 and 2023, it supported 25 public-private partnerships in 15 developing countries to create satellite-based digital advisory and financial services for smallholder food producers.

smallholders rarely sustains EO-enabled advisory services at scale, leading many initiatives to pivot toward intermediary models where aggregators or sectoral institutions contract at portfolio level (NSO, 2022). This pattern is documented across different contexts, including MUIIS in Uganda (Noort, 2021; NSO, 2024) and GEOPOTATO in Bangladesh (NSO, 2022; NSO, 2024), where continuity depended on bundling, aggregation, or institutional intermediation rather than direct end user payment.

Enabling infrastructure prerequisites (connectivity, cloud, local processing)

Enabling infrastructure constraints shape real unit costs and operational feasibility, but are not always priced into projects. Where connectivity, storage and compute capacity, hosting environments and public sector IT readiness are weak, project teams rely on temporary workarounds during the funded phase, including external hosting, exceptional technical assistance or parallel delivery arrangements. These workarounds can make projects appear viable while masking the longer-term cost of operating the same service at institutional reliability, and they increase the likelihood that services degrade when exceptional support is withdrawn.

Temporality (project cycles vs institutional adoption horizons)

A further constraint is the mismatch between short project cycles and the longer horizons required for institutional adoption and budget absorption. Interviewees and programme evidence (NSO, 2021; NSO, 2022; Ifejika Speranza et al., 2023) indicate that public agencies may need multiple budget cycles to assign mandates, establish procurement routines and build internal capabilities (Filippi and Aiello, 2024), while technical solutions can be delivered within a standard project timeframe. Without early planning for recurrent financing and ownership, services can reach technical readiness within projects but still stall in institutional uptake or lapse when external support ends (NSO, 2022; Lages et al., 2023).

CAPEX vs OPEX imbalance

The CAPEX versus OPEX imbalance remains a recurring risk (Lages et al., 2023). Stakeholders noted that programmes can be comparatively effective at financing assets, platforms or initial development, but struggle more with the recurrent operating expenditure required for service continuity, including maintenance, updates, user support, quality assurance and institutional embedding. Evidence from public sector uptake illustrates how OPEX constraints can neutralise initial investments: in Brazil, environmental agencies reported that even when EO tools and data were available, limited recurrent budgets for staffing and basic IT upkeep created a cycle of short term contracts, loss of trained staff and operational

bottlenecks such as extremely slow data access, undermining routine use (Cerbaro et al., 2020).

2.4 Financing constraints that reinforce the transition challenge

The transition from externally funded delivery to recurrent service finance is constrained by a set of recurring financing frictions. These frictions sit between early-stage support and large-scale investment instruments, and they shape whether EO service providers can stabilise multi-year delivery.

Ticket size and transaction costs

Many EO service providers face a well documented "valley of death" between early proof of concept support and the ticket sizes required for scale (Esendi and Munjua, 2019; Lages et al., 2023). On the grant side, early-stage mechanisms can be limited to around €125,000, as illustrated by the G4IFF Innovator's Challenge[2], while more mature scale oriented facilities operate at an order of magnitude higher, for example the G4AW Facility's €1.5 to €3.5 million per project range (Noort, 2021). Sector studies also point to a structural threshold around €1 million in turnover as the dividing line between very small firms and established industrial actors (Lafaye, 2017), which helps explain why sub-scale providers struggle to cross into repeatable delivery capacity. Interviews reinforce the same pattern from the market side: several practitioners describe "agile pilots" typically capped in the €50,000 to €200,000 range, while DFI instruments are perceived as structurally oriented toward much larger tickets, rarely engaging below €10 million and often targeting €30 to €40 million investments. The result is a persistent missing middle where firms are too mature for seed prizes but too small to justify investor transaction costs, even though interviewees locate operational sustainability and scale up needs squarely inside that gap, with indicative minimum thresholds in the low single digit millions.

Mismatch with DFI and bank operating models

DFIs and banks are typically structured to finance asset backed investments and large projects with stable repayment profiles. By contrast, EO-enabled delivery often takes the form of recurring service contracts built on software, data workflows and human capital, with limited tangible collateral. This structural mismatch makes standard lending instruments harder to apply to EO service delivery models, and helps explain why support frequently shifts toward equity driven by the rise of "New

[2] The G4IFF Innovator's Challenge was launched in 2018 by the Netherlands Platform for Inclusive Finance (NpM) in partnership with NSO, Rabobank Foundation, the Dutch Entrepreneurial Development Bank (FMO) and the Bill & Melinda Gates Foundation. The challenge awarded €125,000 grants to winning companies to pilot satellite-based credit risk and financial services for smallholders.

Space" venture capital (Denis et al., 2017) or blended finance approaches designed to de-risk investments for EO-related service providers (NSO, 2022).

Weak bankability signals

For financiers, many public value EO services do not present the core features of a bankable proposition: predictable contracted cash flows over multiple years, a credible repayment source, and enforceable payment commitments (Noort, 2021; NSO, 2022). Because revenues often remain tied to time-bound project budgets rather than recurrent service procurement, providers struggle to build the visibility and track record needed to underwrite debt, and contracts frequently remain short, one-off, or difficult to renew (NSO, 2022). The result is that the risk profile stays dominated by demand and budget uncertainty rather than controllable delivery risk (Noort, 2021).

Fragmented demand and contracting

Demand is rarely consolidated, instead, procurement is split into multiple low volume lots (e.g., hardware, civil works, software). Interviews with private providers suggest this increases coordination costs and dilutes end-to-end accountability. High transaction costs also stem from fragmented mandates, as suppliers must navigate between institutions to identify who holds decision rights and budget authority for contracting. This fragmentation weakens incentives to invest in operationalisation and long-term support, and can create a perverse dynamic where firms are pushed to "jump from one project to another" to fund successive prototypes rather than maintain an operational service without a stable contracting pathway.

2.5 Why existing financial instruments underperform

These frictions help explain why existing instruments often deliver strong project outputs and technical progress, yet underperform on the specific task of stabilising recurrent service finance. The issue is rarely that instruments "do not work". More often, each instrument tends to be deployed for problems it can address well, while leaving key failure modes untreated (recurrent OPEX, contracting pathways, and institutional ownership).

The following instrument mapping is an analytical synthesis based on interviews, programme documentation and selected development finance literature.

Table 1. Financial instruments: best uses and common limitations

Instrument	Who typically uses it	Examples of initiatives it supports	Good uses	Limits
Grants	European Commission (DG INTPA, DG DEFIS), ESA, regional organisations, national space/innovation agencies	GMES & Africa, Intra-ACP ClimSA, CopPhil	Effective for de-risking early design and development, funding demonstrations, initial productisation, and subsidising services where market payment is structurally weak (public value, last-mile).	Can lock delivery into time-bound cycles, with incentives to optimise for project outputs rather than operational continuity. Often cover build costs but not multi-year service obligations, and can fragment demand through many small, parallel initiatives.
Technical assistance (TA)	European Commission and implementing partners, ESA programmes, development agencies	CopPhil capacity building and service enablement, WG Africa training-of-trainers, CASSINI business acceleration services	Can address adoption constraints that finance alone cannot solve, including institutional process redesign, procurement readiness, data governance, training systems, and service management capability.	Frequently delivered as stand-alone capacity building rather than embedded change management tied to a live service contract. Can remain externalised, leaving limited internal ownership once TA ends.
Loans	DFIs and MDBs (e.g., EIB and other Team Europe finance institutions), national development banks	Global Gateway enabling infrastructure investments (digital connectivity, data centres), large	Fit asset-backed investments and large programmes where repayment sources are stable and enforceable,	Many EO public value services lack predictable multi-year cashflows and collateral, and borrowers may face budget constraints that make

		public-sector digital infrastructure programmes	including enabling infrastructure (connectivity, compute, data centres) when a clear borrower and budget or revenue commitment exists.	recurring repayment difficult to commit. Loan structures also struggle with OPEX-heavy delivery models.
Guarantees	European Commission (EFSD+), DFIs, guarantee providers in Team Europe architecture	EFSD+ guarantee operations supporting investment in partner countries	Reduce lender risk where the core barrier is risk perception rather than project fundamentals, especially in partner contexts with high counterparty or country risk.	If the underlying issue is weak or uncertain revenue, a guarantee does not create bankability; it only shifts part of the risk. Guarantees also do not solve fragmented contracting or unclear mandates.
Blended finance	EIC Fund and European Commission, DFIs/MDBs (Team Europe), philanthropic and impact investors (as concessional layers)	EIC Accelerator (grant + equity), EFSD+ blending structures under Global Gateway	Can combine concessional elements with commercial capital to bridge risk and affordability gaps, particularly where services generate public value but have partial revenue potential through intermediated models (B2B2C, B2G).	Can remain too large and complex for service providers below scale, with high structuring costs and long lead times. Can also drift toward infrastructure CAPEX while leaving the service OPEX tail unresolved.
Results-based finance (RBF)	Public payers and funders using performance-linked disbursement, sector	CAP monitoring and conditionality-linked schemes (e.g., Paying Agencies using EO	Can strengthen accountability and performance incentives where outputs or outcomes	Outcomes can be hard to attribute, and RBF can increase transaction costs and verification burdens. It also

	agencies with verifiable metrics	evidence), performance-linked service delivery programmes	can be measured credibly (coverage, timeliness, service quality, uptake metrics), and help shift delivery toward routine performance.	does not automatically create a long-term buyer or budget line.
Procurement and contracting	Public authorities (ministries, agencies), ESA and EU procurement channels, sector agencies	Copernicus operational and service contracts, framework contracts led by public agencies, service-level contracts via lead agencies/aggregators	Core pathway to recurrent finance for public value EO services, converting time-bound activity into enforceable service obligations with defined accountability, service levels, and budget authorisation.	Can be slow and fragmented, with tenders split into low-volume lots and unclear end-to-end accountability. Without framework agreements or aggregators, transaction costs remain high and suppliers face stop-start contracting.
Vouchers and small-scale innovation support	Innovation agencies and programmes, ESA and EU entrepreneurship pipelines, challenge funds	EO AFRICA R&D seed calls, hackathons and challenge prizes (e.g., CASSINI), small testing vouchers	Catalyse early experimentation, help users test services, and build initial relationships between providers and public agencies.	Rarely bridge the step from proof of value to operational procurement, and can increase fragmentation by creating many small proof points without a credible scale pathway.

Source: Author's synthesis (interviews, programme and literature sources).

2.6 What this diagnosis implies for deal design

Taken together, the constraints set out in this section suggest that the central challenge is less the availability of innovation finance, than the lack of credible payment and contracting architecture for recurrent service provision. In practice, "what works" is less about choosing a better instrument in isolation than about designing deals that align who benefits, who pays and who holds the mandate to procure and renew services.

This implies that deal design should start from payer architecture rather than from the instrument menu. The key question becomes: which actor can credibly aggregate demand and sustain payments over time, through which budget line or commercial incentive and under what contractual form? The next section therefore shifts from diagnosing failure modes to structuring repeatable operating archetypes, each defined by a distinct payer configuration and risk allocation logic, and then maps financial instruments to those archetypes as supporting components rather than as standalone solutions.

3. Vade-mecum: three bankable archetypes

3.1 How the archetypes were derived and when not to use them

The archetypes were derived by working backward from recurring failure modes observed in EO-for-public-value delivery: limited ability to pay at the last-mile, absence of stable multi-year cashflows, fragmented mandates and procurement, and enabling infrastructure constraints that inflate unit costs. Each archetype addresses these failure modes by positioning a credible payer in a structurally plausible role to sustain recurrent OPEX and contractual accountability.

These archetypes are not the right starting point when the underlying conditions for recurrent payment and ownership are missing. In particular, they are less likely to perform when (i) no actor can credibly sustain payments beyond a project cycle, (ii) mandates for procurement and renewal are structurally unclear, (iii) the service is not operationally critical (nice-to-have rather than must-have), or (iv) enabling infrastructure and capabilities are so weak that minimum reliability cannot be achieved without open-ended external support. In such cases, priorities should shift toward upstream risk reduction and institutional readiness, rather than forcing a premature "bankable" structure.

3.2 Archetype 1: Anchor tenant (multi-year SLA / procurement-backed)

Mechanism

A public authority, or a mandated public agency, acts as an anchor tenant and contracts an end-to-end EO-enabled service under a multi-year agreement (EP, 2023) with clear service levels (SLA), governance, and accountability. The anchor tenant consolidates demand internally across departments, regions, or beneficiary groups and becomes the single credible counterparty for suppliers. The service is procured as an operational capability with renewal logic and performance monitoring designed upfront, rather than delivered as a time-bound project.

Public authorities become anchor tenants when EO directly supports their fiduciary responsibility to manage public assets, fiscal exposure and regulatory obligations. This typically occurs when EO enables earlier or more defensible decisions on infrastructure maintenance, disaster risk mitigation, or compliance reporting. For example, documenting flood exposure or land degradation can require authorities to adjust maintenance plans, update risk registers, or justify preventive investment.

Financing logic

The central shift is institutional, not financial: converting "project mode" activity into recurrent service procurement that can be budgeted, authorised, and renewed. This gives financiers the revenue visibility they need to assess and price risk. This archetype becomes most financeable when the service fee is structured as a predictable multi-year payment stream linked to service availability and performance, shifting risk from "demand uncertainty" toward "delivery performance".

Typical contract form

A multi-year framework agreement or service contract with defined SLAs, reporting cadence, change control, and renewal provisions. Where feasible, availability-style payment structures (pay for an available, monitored capability) can reduce demand risk and make delivery risk the dominant risk driver.

Where it fits

This archetype fits when the service is clearly of public value and must persist beyond donor cycles, a public mandate exists (or can be created) to procure the service, and the buyer can credibly ring-fence recurrent OPEX. It is particularly suited to compliance and monitoring functions, early warning and risk management, operational decision support, and other "always-on" public services where continuity

is part of the value proposition (e.g., monitoring regimes, paying-agency style controls, disaster risk operations).

Table 2: Key risks and mitigations

Risk	Mitigation
Budget discontinuity risk: multi-year budgeting and internal budget absorption may fail after the funded phase.	Design early budget line anchoring and include transition milestones (who owns what, when, and with what budget authority).
Procurement fragmentation risk: tenders are split into low-volume lots, diluting accountability.	Procure the service end-to-end (outcomes/SLA oriented) rather than slicing inputs, or use a prime contractor model with clear responsibility.
Capability absorption risk: the public buyer contracts the service but cannot operationalise it internally.	Embed service management and user support into the contract, and specify minimal institutional routines (data governance, reporting cadence, escalation, training refreshers).
Supplier lock-in risk: long contracts can lock the buyer into a vendor or platform.	Mandate interoperability, data portability, transparent performance reporting, and periodic competitive re-tender points.

Source: Author's synthesis (interviews, programme and literature sources).

Limits and when not to use it

This archetype can be difficult to execute in partner-country environments where public budgets are rigid, procurement rules do not allow multi-year service commitments, or payment authority is too fragmented to sustain recurrent OPEX. In some settings, political economy factors also limit feasibility: administrations may prefer internalisation and "sovereignty" over outsourcing an operational capability, or may resist end-to-end service contracting if it is perceived as reducing control. Where these constraints dominate, an anchor-tenant design risks reverting to short, one-off project cycles rather than establishing routine service delivery. In contexts where these limiting factors apply, Section 5 sets out sequencing options and instrument packages that can help de-risk the model and progressively establish the required preconditions.

Box 3: PhilSA and CopPhil: a public agency as anchor tenant and regional anchor

Under the Global Gateway strategy, the European Union has supported the CopPhil programme in the Philippines to establish a structuring national capability anchored in the Philippine Space Agency (PhilSA). The intent is not to fund a multiplicity of isolated projects, but to consolidate an operational, centrally managed capacity within a mandated public institution.

This configuration aligns closely with the anchor tenant archetype. PhilSA acts as a credible public counterparty by centralising infrastructure and expertise, notably through a Copernicus Data Centre that enables user agencies to access and process EO data without relying on costly local hardware. Demand is then organised around a portfolio of priority services, defined by public needs and structured as operational capabilities rather than time-bound project deliverables.

The anchoring effect is reinforced by a regional trajectory. PhilSA is positioned as a technical anchor for the SCOPE DIGITAL initiative, with a logic of extending the model and providing technical support to other actors across ASEAN. This illustrates how a national anchor tenant can become a stabilising node for regional scale up.

Source: Author's synthesis (interviews, programme and literature sources) (EC, 2023; PhilSA, N.d.; GovInsider, 2025).

3.3 Archetype 2: Intermediate aggregator

Mechanism

A) Commercial service aggregator

A commercial or semi-commercial intermediary aggregates demand and embeds EO-enabled services into an existing product, distribution channel, or risk management function. Typical aggregators include insurers, financial institutions, agribusiness offtakers, input suppliers, platform operators, and utilities with an established user base. End users benefit, but do not pay directly, or only pay marginally through a bundled offering. Payment occurs because EO improves commercial performance or reduces risk exposure within existing revenue-generating activities.

B) Financial risk intermediary

A distinct variant of the aggregator model arises when financial intermediaries, like (re)insurers, embed EO directly into risk transfer products. In parametric insurance,

for example, EO data is used to define payout triggers based on measurable physical indicators such as vegetation condition, rainfall, or flood extent. EO becomes part of the contract itself, determining when payments are made. In this case, insurers procure EO not as an advisory service, but as operational infrastructure required to structure and operate insurance products. This model directly converts EO into financial flows and represents one of the clearest pathways through which EO enables private sector participation. Without EO-based triggering and monitoring capacity, the development of this market is significantly constrained.

Financing logic

Bankability comes from the aggregator's ability to monetise value through an existing revenue engine. The EO-enabled service is justified as a cost that improves portfolio performance, for example by reducing losses, improving underwriting, lowering default rates, increasing customer retention, improving supply chain reliability, or supporting compliance requirements. The service fee is therefore not anchored in last-mile willingness to pay, but in measurable portfolio-level value capture.

Typical contract form

A B2B service contract between the EO provider and the aggregator, often linked to portfolio KPIs or proxy metrics such as coverage, timeliness, risk score performance, loss ratio improvement proxies, claim processing time, or default probability reduction. In mature cases, the EO service provider can secure multi-season or multi-year commitments because the aggregator's own product cycles are recurrent.

Where it fits

This archetype fits when value accrues to a commercially motivated actor with scale, an existing distribution channel, and a recurrent reason to pay. It is particularly suited to agricultural advisory linked to finance or insurance, supply chain monitoring, and market access models where the aggregator can bundle the service as part of an integrated offer.

Table 3: Key risks and mitigations

Risk	Mitigation
Value capture ambiguity: the aggregator may not perceive sufficient incremental value to pay recurrently.	Design the proposition around portfolio-level value, agree on a small set of proxy KPIs that track the business benefit, and align reporting cadence to the aggregator's own decision cycle.
Data and governance risk: end user trust, consent, and data governance can become blockers, especially when EO outputs feed eligibility, pricing, or enforcement decisions.	Include explicit data governance, transparency, and auditability provisions, with clear user-facing communication and appeal or recourse pathways where relevant.
Channel dependency risk: the EO provider can become dependent on a single aggregator and lose leverage over pricing and renewal.	Limit exclusivity, design for portability across aggregators, and standardise interfaces so the service can be replicated through multiple channels.
Inclusion risk: aggregator incentives may prioritise commercially attractive segments and exclude the poorest or most remote.	Use targeted public co-financing, guarantees, or outcome-linked payments to extend coverage to underserved segments without breaking the aggregator's unit economics.

Source: Author's synthesis based on G4AW/G4IFF programme evidence (NSO, 2022; NSO, 2024; Noort, 2021) and expert interviews.

Limits and when not to use it

This archetype is less suitable where no credible aggregator exists with both scale and an incentive to pay recurrently, where margins are too thin to absorb the service cost, or where the service value cannot be translated into metrics the aggregator trusts for decision making. It can also underperform where data governance constraints or political sensitivities make portfolio scoring or automated decisions difficult to operationalise, or where inclusion objectives are central but cannot be protected through complementary public support. Section 5 outlines how sequencing and instrument packaging can be used to strengthen payer capacity, governance, and renewal pathways, enabling the archetype to become feasible.

Box 4: Intermediate aggregator in practice: Sat4Rice and Lộc Troi (Vietnam)

In Vietnam, the Sat4Rice initiative illustrates how EO-enabled services can become financially viable when embedded in an existing value chain rather than sold directly to smallholders. The intermediary, Lộc Troi Group (LTG), operates as a large input supplier and rice off-taker with a nationwide distribution and extension network. Instead of each farmer purchasing EO data or advisory, LTG contracts the EO-enabled service and integrates the outputs into its own operations and farmer-facing services.

Mechanism: EO-based crop monitoring supports agronomic advice delivered through LTG's field staff and channels, while also feeding LTG's planning and operational management across thousands of contracted farmers. For farmers, the EO layer is effectively "bundled" into the relationship with LTG rather than purchased as a standalone product.

Financing logic: the EO-enabled service helps LTG improve harvest timing forecasts and operational logistics, use labour and machinery more efficiently, strengthen monitoring of input credit and crop performance, and streamline reporting processes. These benefits accrue to LTG's own P&L through lower transaction and operational costs and improved supply-chain reliability, making recurrent payment rational even when individual farmers' ability to pay is limited.

Why this validates Archetype 2: Sat4Rice shows how bankability can be created when a commercially motivated actor with scale and a distribution channel internalises EO costs and pays through an existing revenue engine, while end users benefit without needing to directly fund the EO service.

Source: Authors' synthesis based on G4AW programme evidence (NSO, 2021; NSO, 2024).

3.4 Archetype 3: Regional utility (platform / infrastructure logic)

Mechanism

A shared regional capability provides enabling infrastructure and common services, data access, compute, hosting, reference layers, standards, interoperability, and core analytics, that multiple countries and agencies can use. The utility is hosted by a regional institution or a designated hub, with participating members accessing the platform through defined governance, service tiers, and support arrangements. The

utility focuses on shared enabling infrastructure and common services, lowering marginal costs and reducing transaction burdens for downstream delivery.
The regional utility model becomes particularly relevant when multiple actors depend on the same landscape conditions but cannot individually justify full investment. In this case, the EO service provides a shared reference system that allows different institutions, such as governments, utilities and insurers, to coordinate decisions and investment based on a common understanding of landscape dynamics. This shared visibility enables actors to manage risks that extend beyond individual asset boundaries.

Financing logic

The regional utility model is justified when (i) individual national buyers cannot sustain enabling infrastructure alone, (ii) demand is fragmented across jurisdictions, and (iii) costs are dominated by shared fixed OPEX (compute, connectivity, maintenance, upgrades, baseline datasets, and specialised staff). Bankability comes from pooling demand and financing an operational backbone that makes downstream services cheaper to deliver and easier to procure. In practice, the financing case is strongest when the utility has (a) pre-agreed multi-year funding commitments from anchor members and/or donors, and (b) a credible pathway from subsidised access to tiered service recovery over time (even if partial).

Typical contract form

A multi-actor governance and financing arrangement (membership contributions, service subscriptions, pooled donor/public finance), paired with operational SLAs for platform availability, support, and change control. The utility can then enable downstream contracts (Anchor Tenant or Intermediate Aggregator models) in specific domains, with reduced procurement and onboarding costs.

Where it fits

This archetype fits when regional coordination is feasible and enabling infrastructure is the binding constraint, especially where national IT readiness is uneven, data/compute costs dominate, or cross-border comparability is essential. It is particularly suited to services requiring shared reference layers and standardisation across countries (climate services, coastal and marine monitoring, transboundary water basins, regional food security monitoring, and early warning systems).

Table 4: Key risks and mitigations

Risk	Mitigation
Governance and mandate risk: regional ownership can be politically complex and slow, with "power loss" concerns and contested priority-setting.	Keep scope narrowly focused on enabling functions; define clear membership value; separate strategic governance from day-to-day operations; use transparent service catalogues, SLAs, and escalation rules.
Sustainability risk (the permanent OPEX tail): platforms can become donor-dependent with recurring hosting, staffing, and upgrade costs.	Define tiering and pricing early (even if subsidised initially); pre-agree minimum multi-year commitments from anchor members; ring-fence core OPEX; treat compute/connectivity as part of the service, not an afterthought.
Mismatch risk (platform without downstream demand): a backbone is built, but no one contracts services on top of it.	Require at least one "first-user contract" per priority domain (or per participating country cluster) as a condition of platform investment; embed service onboarding and procurement readiness as funded workstreams.
Physical infrastructure risk: on-premise installations can create high recurring operating burdens linked to energy, cooling, maintenance, and upgrade cycles.	Default to cloud/hybrid approaches where feasible; prioritise connectivity + skills over servers; modularise components so capacity can scale with real usage.
Crowding-out risk: a publicly funded utility can inadvertently displace local private providers.	Position the utility as a backbone (open interfaces, shared datasets, compute credits) and leave last-mile applications to local markets; publish APIs and interoperability standards to enable competition.

Source: Author's synthesis (interviews, programme and literature sources).

Limits and when not to use it

This archetype is a strong answer to fragmentation and shared fixed costs, but it is **not** a substitute for a payer and contracting pathway for last-mile services. It should be avoided (or tightly scoped) when regional governance is politically infeasible, when member contributions are unlikely to materialise, or when the platform risks becoming a standalone infrastructure project disconnected from adoption and procurement downstream. Section 5 provides options to help enable the necessary conditions and connect this backbone model to credible downstream contracting pathways.

Box 5: Regional utility in practice: RCMRD as a shared backbone for Eastern and Southern Africa

A clear illustration of the Regional Utility archetype is the Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi and serving a large group of member states across Eastern Africa. The core rationale is scale: the African Space Policy highlights the need to establish regional centres of competence to avoid the duplication of resources and efforts, particularly where high capital investment for infrastructure is required (AUC, 2019). A regional hub can concentrate scarce skills and shared infrastructure, then distribute standardised products and technical support to national agencies that would otherwise face prohibitive fixed costs.

In this model, the utility functions as a shared backbone rather than as a last-mile service provider. It reduces duplication by providing common building blocks such as data access and hosting arrangements, baseline layers, processing workflows and technical assistance, which national administrations can then adapt for domestic use cases. This division of labour is particularly relevant in partner-country environments where the main barrier is not the availability of EO data, but the operational capacity to turn it into reliable and repeatable public services.

The case also illustrates the central fragility of the archetype: recurrent operating finance. Member contributions are often insufficient to fund sustained operations at the level required for modern EO services, and expectations of "free" access can undermine cost recovery. This is why the example is useful for deal design. It shows that a regional utility becomes viable when it is financed as an operational backbone with predictable multi-year support, and when its role is explicitly connected to downstream contracting pathways rather than treated as a standalone infrastructure investment.

RCMRD's proposal to pursue a more direct funding relationship, including pathways that reduce intermediary overheads and protect post-project maintenance budgets, also highlights a practical approach to strengthening the utility's operating model. The broader lesson for the Regional Utility archetype is that shared infrastructure and shared capabilities can be the right answer in high-constraint markets, but only when governance, OPEX continuity and downstream adoption are designed in from the outset.

Source: Authors' synthesis based on interviews, stakeholder consultations, and selected literature (AUC, 2019; Woldai, 2020; Ifejika Speranza et al., 2023).

Table 5: Archetype crosswalk table

Archetype	Who pays	Who benefits	Typical contract type	Key costs (cost drivers)	Key risks
1. Anchor tenant (multi-year SLA / procurement-backed)	A public authority or mandated public agency acting as single buyer; may aggregate across ministries, regions, or agencies	Citizens, public administrations, regulated beneficiaries (farmers, coastal communities, municipalities) via improved public services	Multi-year service contract / framework agreement with SLA; sometimes availability-style payments; renewal and change-control provisions	Recurrent OPEX (service delivery team, data workflows, support); service management; QA/QC; onboarding and training refreshers; minimal enabling IT (hosting / connectivity)	Budget discontinuity; procurement fragmentation; capability absorption (low internal uptake); supplier lock-in / interoperability; dependence on donor funding
2. Intermediate aggregator (Commercial service)	Commercial or semi-commercial intermediary (insurer, FI, offtaker, input supplier, platform operator, utility); pays at portfolio level	End users (farmers, SMEs, households) receive the service bundled into another product; aggregator captures portfolio-level value	B2B service contract; often multi-season / multi-year; may include KPI-linked pricing (risk scoring, coverage, turnaround times)	Portfolio integration (IT + processes); last-mile delivery channel (agents, call centres, mobile); MRV/verification and customer support; ongoing model tuning	Value capture ambiguity (ROI not proven); channel dependency; data governance/consent and trust; inclusion risk (cream-skimming)
3. Regional utility (platform / infrastructure logic)	Pooled public funding (member states, regional bodies), donor support, or hybrid subscriptions;	Multiple countries/agencies and downstream providers who reuse shared infrastructure;	Multi-actor governance + service tiers; membership fees/subscriptions ; operational SLAs	High fixed costs: compute/cloud, hosting, maintenance, upgrades, baseline datasets; core	Governance/mandate complexity; unfunded OPEX tail; misalignment with downstream demand (platform

	often anchored by a host institution	citizens benefit indirectly through better national services	for platform availability; downstream contracts enabled (Anchor tenant / Aggregator)	technical team; interoperability standards; helpdesk/support	not used); crowding out local private actors if utility goes too far downstream

Source: Author's synthesis (interviews, programme and literature sources).

*Section 5 provides the instrument menu and sequencing guidance aligned to each archetype.

4. The economic equation: quantification and de-risking

Section 3 set out three bankable operating archetypes, each defined by a credible payer configuration and a pathway to recurrent service delivery. Section 4 translates those operating models into an economic equation that can be priced, contracted, and financed. It does so by making costs explicit across the lifecycle, clarifying payment architecture and triggers, stress testing risk allocation under realistic default scenarios, and then isolating the specific problem that repeatedly breaks EO-for-public-value delivery in high-risk markets: the unfunded OPEX tail.

4.1 Quantification template

The starting point is a full cost view that reflects how EO-enabled services actually behave in operations. This includes not only the obvious technical costs, but also the recurrent and often underbudgeted components that determine whether a service can be renewed.

The costs and effort across the lifecycle can be structured in six categories.

- **CAPEX for any enabling assets** that must exist before service delivery is feasible, such as baseline data preparation, initial platform configuration, hardware where unavoidable, or integration work into existing systems.
- **OPEX for the service itself**, including cloud and compute, data access, model maintenance, service management, and routine updates.
- **The OPEX tail**, meaning the post pilot period during which the service must run reliably while budget absorption, procurement routines, and institutional ownership are still stabilising.
- **Last-mile adoption and operationalisation**, including user support, training refreshers, workflow integration, and change management.
- **Enabling infrastructure dependencies**, such as connectivity, hosting arrangements, interoperability layers, and security requirements that can dominate costs in low readiness contexts.
- **Transaction and MRV costs**, covering procurement effort, contract management, verification, audits, and any compliance burden required by payers.

The purpose of the template is to prevent systematic underestimation of the recurrent cost base and to make the minimum viable service package explicit before any instrument is selected.

4.2 Payment architecture and triggers

Once costs are mapped, the next step is to specify how payments can credibly flow over time. This is where payer architecture becomes operational. The design question is not simply who benefits, but who can legally and practically pay, through which channel, and on what basis. Each archetype corresponds to a distinctive payer logic and therefore to a distinct type of payment trigger.

- For the **anchor tenant archetype**, the payment channel is typically a public budget line executed through procurement or a framework contract. The trigger should be tied to service availability and performance against agreed SLAs, because demand is not something the supplier can control. Bankability is strongest when EO-enabled delivery is converted from discretionary innovation into a mandated operational service embedded in budget cycles.

- For the **intermediate aggregator archetype**, the payment channel is a commercial revenue engine, such as premiums, interest margins, input sales, offtake margins, or fee income. The trigger is usually contractual delivery of risk scores, monitoring coverage, timeliness, and portfolio-level proxies that track value capture. Here EO is financed indirectly: it strengthens a revenue-generating transaction rather than being purchased as a standalone service.

- For the **regional utility archetype**, the payment channel is pooled financing, membership contributions, or multi-year operating support, complemented by downstream service contracts that the platform enables. The trigger is platform availability and the delivery of shared baseline services, with an explicit link to downstream uptake so that the platform does not become an isolated infrastructure layer. The financial logic is collective cost-sharing for enabling infrastructure that individual buyers cannot efficiently finance on their own.

Across all three archetypes, the payment trigger must be designed to match what can be verified at reasonable cost. Where high fidelity measurement is expensive or contested, pragmatic proxies are often more bankable than attempting to pay on ultimate outcomes.

4.3 Risk allocation and default scenarios

A core principle is that suppliers can be held accountable for service delivery and performance against agreed specifications, but they cannot credibly assume risks that sit outside their control (budget execution, political decisions, macro shocks, or adoption choices). Risk allocation should therefore follow control: each party should carry the risks it can influence, and contracts should make default pathways explicit.

These default scenarios below are not intended to be exhaustive. They are a pragmatic "minimum set" derived from recurring failure modes observed across EO-for-public-value delivery and from the risks that most directly affect contract bankability. They were selected because they map to the main points of control and accountability in a deal: the payer's ability to pay, the supplier's ability to deliver, the user system's ability to adopt, the enabling infrastructure's reliability and exogenous shocks.

Explicitly defining these scenarios is essential because bankability depends not only on how payment is triggered, but also on what happens when the condition for payment cannot be met as planned.

- Scenario 1: Payment interruption or budget freeze (payer-side default)

Risk allocation implication: the payer retains budget execution and political risk; the supplier should not be expected to finance sovereign non-payment. Non-payment should trigger clearly defined remedies and, if unresolved, an orderly suspension or termination with agreed continuity and exit steps.

- Scenario 2: Service under-performance or prolonged outage (supplier-side default)

Risk allocation implication: the supplier carries delivery and performance risk; payments and remedies should be tied to availability and quality against SLAs, with escalation, service credits, and cure periods. The payer carries demand or usage variability, but not technical delivery risk.

- Scenario 3: Adoption failure despite service availability (institutional uptake default)

Risk allocation implication: the buyer carries internal change management, staffing, and operational adoption risk; the supplier carries only the enablement obligations

explicitly contracted (training, support, documentation, refresh cycles). Lack of uptake is not supplier default unless user-side routines are defined as contractual obligations.

- Scenario 4: Procurement or mandate fragmentation prevents renewal (authority-side default)

Risk allocation implication: the public side carries mandate clarity and renewal risk; the supplier should not bear the consequences of internal institutional fragmentation. Contracting should be structured to maintain single-point accountability and avoid splitting responsibilities in ways that make performance management impossible.

- Scenario 5: Data access or enabling infrastructure failure (connectivity, hosting, security constraints)

Risk allocation implication: prerequisites for connectivity, hosting, data access, and security should be explicitly defined as conditions for reliable delivery, with responsibilities allocated to the parties controlling them (typically the buyer, the platform operator, or a designated infrastructure provider). Where prerequisites are not met, obligations should shift to a pre-agreed degraded mode, re-baselining, or suspension rather than treating the issue as supplier non-performance.

- Scenario 6: Exogenous shock disrupts delivery or payment capacity (force majeure and macro shocks)

Risk allocation implication: shock risk should be treated separately from performance risk. Contracts should define force majeure and “shock clauses” that specify temporary service prioritisation, agreed fallback service levels, and renegotiation triggers, so that neither party is pushed into absorbing systemic risks that cannot be priced or managed contractually.

4.4 De-risking the “OPEX tail”

Across contexts and archetypes, the same breaking point recurs: pilots and early deployments can be funded, but recurrent delivery collapses in the transition period when the service must run reliably while the payer side still builds the budget line, procurement routine, and institutional ownership needed for renewal (hereafter the “OPEX tail”).

Based on expert interviews, a recurring solution to this transition problem is to establish **a time-limited bridging mechanism** to maintain operations while the durable payer pathway is put in place. In this report, we refer to this as a "service window". The service window, as largely suggested by expert interviews, isolates that transition problem and treats it as a bounded de-risking need rather than as an indefinite subsidy. In practical terms, it is a time-limited mechanism designed to keep the service operational while the pathway to a durable payer is established. Its role is to protect continuity, reduce the perceived risk for suppliers and co-payers, and create a credible bridge from donor supported delivery to a sustainable contracting model.

A service window is not a solution on its own: it only makes sense when there is a credible end state and a defined set of milestones that shift responsibility to the long term payer architecture. It should therefore be used with clear conditions, including a verified buyer mandate, an agreed absorption plan, procurement readiness steps, and a timetable for budget anchoring or commercial integration. Where those conditions are absent, the priority is not to extend the window but to return to upstream readiness and risk reduction until a credible pathway exists.

Section 5 turns this logic into actionable sequencing and instrument packages, showing how Team Europe actors can progressively build the necessary conditions for each archetype while avoiding recurring pilot traps.

5. Operational toolkit and recommendations

This section focuses on how Team Europe actors can sequence support over time, choose instruments that fit the payer architecture and shift from pilot logic to recurrent service delivery without creating a permanent dependency.

5.1 Sequencing the mix over the lifecycle

A consistent finding across cases, as highlighted in the NSO report Business Models and Scaling, is that instrument choice works best when it follows a clear sequencing logic over the service lifecycle (NSO, 2022)**.** Rather than treating instruments as interchangeable, the aim is to align them to what is binding at each phase: upstream risk and readiness, recurrent payment and contracting routines, and only then scale conditions that can support repayable or blended finance.

The practical discipline is to finance what is missing at each stage, not what is available in the toolbox.

These phases are not strictly linear, in practice they often overlap, but they highlight what tends to be binding at each stage of the lifecycle.

First phase: Transition and readiness (pre-contract, early operations)

At this stage, support typically focuses on reducing upstream risk and strengthening institutional readiness so that services can become contract-ready (Filippi and Aiello, 2024; Lages et al., 2023). This can include technical assistance for user workflows and service management, procurement readiness, data governance, minimum infrastructure readiness, and early operating support where continuity is essential.

Second phase: Recurrent delivery (contracting and budget anchoring)

Once the service proposition is stabilised, attention can shift to converting delivery into a multi-year operating arrangement. This is where budget lines, procurement routines, SLAs, and renewal logic are designed and tested, with payment triggers tied to service availability and performance rather than to downstream demand. Support is most effective when it is linked to progress toward a durable payer, including milestones on mandate, procurement, and absorption.

Third phase: Scale (repayable and blended, where conditions are credible)

Repayable and blended instruments can become relevant when there is a credible payer pathway, enforceable payment triggers, and measurable performance. In these circumstances, instruments can help accelerate scale, but they are unlikely to substitute for missing payment architecture, weak commitment capacity, or unresolved governance constraints (Fay et al., 2021; OECD, 2020; Basile et al., 2020).

Across all phases, the OPEX tail is best treated as a bounded transition challenge. Time-limited bridging mechanisms can help protect continuity while responsibility shifts toward the durable payer architecture, provided conditions and an exit timetable are defined.

5.2 Instrument menu aligned to the archetypes

The financial instruments below are presented as a sequenced menu aligned to each archetype. The intent is not to multiply tools, but to match each instrument to what it can realistically solve at a given stage of the lifecycle: bridging early viability, enabling recurrent payment, and accelerating scale once cashflows and accountability are credible.

Table 6: Archetype 1. Anchor tenant (multi-year public buyer)

Lifecycle stage	Financial instruments	What it does (financial role)	Use when	Watch-outs
Transition	Time-bound grants that explicitly cover early recurrent delivery (bridge funding)	Bridges the gap until recurrent public payments are reliable	Continuity is mission-critical and there is a credible pathway to recurrent public payment	Avoid "rolling bridges" that become permanent subsidies
Transition	Payment risk guarantees (sovereign or sub-sovereign payment backstops)	De-risks delayed/non-payment risk for suppliers or lenders	Payment reliability is the binding risk, not technical delivery	Guarantees cannot compensate for absence of credible payment authority
Recurrent delivery	Concessional finance only when backed by enforceable service payments	Helps fund scale-up investments once a public payment stream is in place	There is an enforceable multi-year payment stream and a clear allocation of payment risk	Do not push repayables when the base payment architecture is not secure
Recurrent delivery	Results-based top-up (RBF add-on)	Rewards verified performance without replacing the base service fee	When stronger incentives are needed for quality/availability/timeliness, on top of a secure base payment	Avoid shifting the whole model into "pure RBF" if base payments are not secure
Scale	Blended finance (limited, targeted)	Accelerates expansion when payment stream is stable and replicable	Replication across agencies/regions is ready and the payment stream is standardisable	Blending is not a substitute for weak commitment capacity

Source: Author's synthesis (interviews, programme and literature sources)

Table 7: Archetype 2. Intermediate aggregator (B2B2C)

Lifecycle stage	Financial instruments	What it does (financial role)	Use when	Watch-outs
Transition	Smart subsidies for inclusion (output/outcome-linked where feasible)	Covers affordability gaps for underserved segments while keeping a commercial core	Commercial incentives would exclude poorer geographies or users	Subsidies should be ring-fenced to inclusion objectives and time-limited
Transition	First-loss / risk-sharing layer (portfolio level)	Absorbs early portfolio risk to crowd in local finance	Local lenders/investors require downside protection to fund the aggregator model	Avoid masking weak unit economics with permanent first-loss
Recurrent delivery	Portfolio guarantees (partial credit guarantees)	Unlocks lending to aggregators and supply-chain finance at scale	The bottleneck is access to working capital or portfolio finance	Ensure underwriting discipline; avoid "guarantee-driven" overexpansion
Recurrent delivery	Revenue-based or cashflow-linked repayables (where applicable)	Matches repayment to actual cash generation	Aggregator has a measurable revenue engine and repeat cycles	Not suitable where revenues are volatile and weakly measurable
Scale	Growth capital (equity / quasi-equity) plus selective blended	Funds expansion once unit economics and retention are demonstrated	The aggregator can scale distribution and retain customers	Avoid going to equity if the product is still in pilot economics

Source: Author's synthesis (interviews, programme and literature sources)

Table 8: Archetype 3. Regional utility (platform / shared infrastructure)

Lifecycle stage	Financial instruments	What it does (financial role)	Use when	Watch-outs
Transition	Capital grants for shared enabling infrastructure	Funds high fixed-cost backbone where no single buyer can carry it	The backbone is the constraint and economies of scale are real	Avoid overbuilding; capex must not create an unsustainable opex burden
Transition	Pooled financing commitments (multi-donor / multi-member)	Creates predictable funding volume and reduces fragmentation	The utility serves multiple jurisdictions with shared benefits	Risk of uneven burden-sharing if commitments are not explicit and durable
Recurrent delivery	Multi-year operating grants (time-bound, declining where possible)	Keeps the utility operational while a stable financing base matures	OPEX sustainability is the binding constraint	Must be tied to a credible pathway to long-term financing
Recurrent delivery	Guarantees for infrastructure debt (only if debt is used)	Lowers cost of capital for bankable infra components	There is a clear repayment channel or public payment commitment	Avoid arrangements that may generate contingent liabilities unless governance, mandate, and decision rights are clearly defined
Scale	Concessional loans / blended for bankable infra components	Scales infrastructure only where cost recovery is credible	Specific components have clear repayment capacity	Not appropriate for core public-good functions without repayment channels

Source: Author's synthesis (interviews, programme and literature sources)

With the sequencing logic and instrument menu in place, the practical question becomes how Team Europe actors can structure engagements so that deals are executable in real-world conditions.

5.3 Operational guidance for implementation

What should be done differently in practice is less about adding new instruments and more about packaging deals so that payment, procurement, governance, and infrastructure readiness align.

Ground each engagement in payer architecture

Identify the credible payer, the budget or commercial channel and the mandate to procure and renew. If the payer is fragmented, design an aggregation route early, either through an anchor agency, a commercial intermediary or a regional platform with defined membership and service tiers.

Prioritise integrated offers over stand-alone EO components

Where possible, embed EO-enabled services into broader sector programmes where financing pathways already exist, such as disaster risk management systems, hydrology and water agencies, agricultural value chains, or compliance and reporting systems. This reduces procurement fragmentation and improves affordability by spreading fixed costs across a larger investment.

Shift procurement toward end-to-end services rather than inputs

Move from buying datasets, studies, and isolated tools to buying an operational service with SLAs, performance monitoring, and renewal logic. Ensure change control, user support, and escalation routines are part of the scope, because these are the real OPEX drivers of sustained delivery.

Make enabling infrastructure explicit and clarify responsibilities

Define minimum prerequisites for connectivity, hosting, cybersecurity, and data access. Assign who provides what, who pays, and what happens when prerequisites fail. Avoid building heavy local infrastructure when OPEX cannot be sustained; prioritise resilient hosting and pragmatic operations aligned to local constraints.

Embed institutional routines and capability absorption into delivery

Fund and require the routines that projects often ignore, including data governance, reporting cadence, training refreshers, product ownership, and contract

management. Where needed, use competence centres or delegated technical institutions to reduce the burden on the buyer while maintaining accountability.

5.4 The checklist

This checklist is meant to be used by Team Europe actors as a quick vade mecum before committing to a financing package or launching procurement.

1. Do we have a credible payer for recurrent delivery, and is the payer willing and able to pay beyond the project cycle?
2. Is the payer architecture clear, including who benefits, who pays and who holds the mandate to procure and renew?
3. Which archetype fits best, anchor tenant, intermediate aggregator, or regional utility, and why?
4. Is there a defined contract pathway, including service scope, SLAs, governance, change control, and renewal logic?
5. Is the OPEX tail covered, and if a service window is used, is it time-limited with clear milestones and an exit path?
6. Are enabling infrastructure prerequisites defined, including connectivity, hosting, data access and security, with explicit responsibilities?
7. Is data governance addressed, including consent, transparency, auditability and data portability where relevant?
8. Is there a realistic absorption plan, including staffing, routines, training refreshers and contract management capability?
9. Are key risks allocated to the party that can control them, and are default scenarios addressed in the contract and financing package?
10. Is inclusion safeguarded, and if market incentives will exclude harder segments, is there a targeted top up or de-risking layer to correct this?

Taken together, the sequencing logic, instrument menu, operational guidance and checklist provide a consolidated toolkit for structuring EO-enabled deals around credible payer pathways, while reducing the recurring risk of pilot-only deployment.

References

African Union Commission. 2019. African space policy: towards social, political and economic integration. Addis Ababa: AUC.

Basile, I., Bellesi, V. and Singh, V. 2020. Blended finance funds and facilities – 2018 survey results. Part II: development performance. OECD Development Co-operation Working Papers, No. 67. Paris: OECD Publishing. https://dx.doi.org/10.1787/7c194ce5-en

Cerbaro, M., Morse, S., Murphy, R., Lynch, J. and Griffiths, G. 2020. Challenges in using earth observation (EO) data to support environmental management in Brazil. Sustainability, 12(24), 10411. https://doi.org/10.3390/su122410411

Denis, G., Claverie, A., Pasco, X., Darnis, J.-P., de Maupeou, B., Lafaye, M. and Morel, E. 2017. Towards disruptions in earth observation? New earth observation systems and markets evolution: possible scenarios and impacts. Acta Astronautica, 137, pp. 415–433. https://doi.org/10.1016/j.actaastro.2017.04.034

Esendi, V. and Munjua, M. 2019. From early stage to scale: sustaining results of G4AW program. Report. Nairobi: AgriProFocus Kenya.

European Commission. 2019. The European Union Earth Observation Programme - Copernicus. Brochure. Brussels: EC.

European Commission. 2022. Space and Earth Observation Activities. Presentation. Brussels: EC, DG INTPA Unit F5.

European Commission. 2023. Global Gateway: European Space Agency and the Commission join forces on earth observation for the Philippines. Web page. Brussels: EC.

European Commission N.d. Global Gateway overview. Web page. Brussels: EC Directorate-General for International Partnerships.

European Parliament. 2023. Towards EU leadership in the space sector through open strategic autonomy. PE 734.691. Brussels: European Parliamentary Research Service (EPRS). https://doi.org/10.2861/73374

Fay, M., Martimort, D. and Straub, S. 2021. Funding and financing infrastructure: the joint-use of public and private finance. Journal of Development Economics, 150, 102629. https://doi.org/10.1016/j.jdeveco.2021.102629

Filippi, E. and Aiello, A. 2024. Barriers, benefits, and influential factors of adopting earth observation satellite data at local and regional levels: the case of the Italian LRAs. Sustainability, 17(1), 145. https://doi.org/10.3390/su17010145

GovInsider. 2025. Philippines anchors new EU partnership to scale space tech across ASEAN. Online article. GovInsider. Available at: https://govinsider.asia/intl-en/article/philippines-anchors-new-eu-partnership-to-scale-space-tech-across-asean

Ifejika Speranza, C., Akinyemi, F.O., Baratoux, D., Benveniste, J., Ceperley, N., Driouech, F. and Helmschrot, J. 2023. Enhancing the uptake of earth observation products and services in Africa through a multi-level transdisciplinary approach. Surveys in Geophysics, 44, pp. 7–41. https://doi.org/10.1007/s10712-022-09724-1

Lafaye, M. 2017. Benefit assessment of the application of satellite earth observation for society and policy: assessing the socio-economic impacts of the development of downstream space-based earth observation applications. In Onoda, M. and Young, O.R. (Eds.), Satellite earth observations and their impact on society and policy (pp. 93–103). Singapore: Springer. https://doi.org/10.1007/978-981-10-3713-9_7

Lages, L.F., Catarino, N., Gomes, E., Toh, P., Reis-Marques, C., Mohr, M., Borde, S.M., Asgari, O., Figueiredo, R., Grosso, N., Perez, D., Ponte, A., Teixeira, S.L., Van Der Schalie, R., Fantin, D., Van Brusselen, J., Taravat, A. and Schmidt, G. 2023. Solutions for the commercialization challenges of Horizon Europe and earth observation consortia: co-creation, innovation, decision-making, tech-transfer, and sustainability actions. Electronic Commerce Research, 23, pp. 1621–1663. https://doi.org/10.1007/s10660-023-09675-8

Morretta, V., Florio, M. and Landoni, M. 2023. The social value of Earth observation: a new evaluation framework for public high-tech infrastructures. Structural Change and Economic Dynamics, 67, pp. 407–419. https://doi.org/10.1016/j.strueco.2023.05.006

Noort, M. 2021. Geodata for agtech and fintech: what have we learned? Report. Utrecht: NpM, Platform for Inclusive Finance.

NSO. 2021. Space for food security: stimulating smallholders' access to emerging agtech and fintech markets. Part 1: users and services (main report). Report. The Hague: Netherlands Space Office.

NSO. 2022. Space for food security: opening and stimulating an emerging market. Part 2: sustainable business models and scaling (main report). Report. The Hague: Netherlands Space Office.

NSO. 2024. Space for food security: geodata for agriculture and water (G4AW) programme closure: G4AW booklet 2013–2023. Report. The Hague: Netherlands Space Office.

OECD. 2020. Global outlook on financing for sustainable development 2021: a new way to invest for people and planet. Paris: OECD Publishing. https://doi.org/10.1787/e3c30a9a-en

Philippine space Agence. N.d. About CopPhil. Web page. Manila: PhilSA.

Sawyer, G., Mamais, E. and Papadakis, D. 2022. The six dimensions of value associated to the use of Copernicus Sentinel data: key findings from the Sentinel Benefits Study. Frontiers in Environmental Science, 10, 804862. https://doi.org/10.3389/fenvs.2022.804862

Woldai, T. 2020. The status of earth observation (EO) and geo-information sciences in Africa: trends and challenges. Geo-spatial Information Science, 23(1), pp. 107–123.

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