



GDA






Global Development Assistance

Midterm Evaluation

September 2024



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Glossary

ABC	Advancing and Building EO Knowledge and Capacity	NBS	Nature-Based Solutions
ADB	Asian Development Bank	NDA	National Development Agency
AID	Agile EO Information Development	OBIA	Object-Based Image Analysis
APP	Analytics and Processing Platform	R&D	Research and Development
CCC	Communicate-Connect-Cooperate	Space for IDA	Space for International Development Assistance
CS	Client State	STC	Short-Term Consultant
DEP	Digital Earth Partnership	TA	Technical Assistance
EARSC	European Association of Remote Sensing Companies	TO	Technical Officer
EO	Earth Observation	TOC	Theory of Change
EOID	EO Information Development	URR	User Requirements Review
EO4SD	Earth Observation for Sustainable Development	WB	World Bank
ESA	European Space Agency		
FCAS	Fragile and Conflict-Affected Situations		
FFF	Fast EO co-Financing Facility		
GDA	Global Development Assistance		
GFDRR	Global Facility for Disaster Reduction and Recovery		
KII	Key Informant Interview		
IFI	International Financial Institution		
IFAD	International Fund for Agricultural Development		
IGAD	Intergovernmental Authority on Development		
M&E	Monitoring and Evaluation		



Executive summary

The European Space Agency (ESA) Global Development Assistance (GDA) programme is a global partnership to mainstream the use of satellite Earth Observation (EO) into development operations.

It aims to bridge the awareness, acceptance, and adoption gap—concerning satellite EO data—between high-income countries and the Client States (CSs) of International Financial Institutions (IFIs). This is intended to support CSs' equitable access to, use of, and benefit from EO data.

This GDA Midterm Evaluation is completed by Caribou Space as part of the M&E and Impact Assessment (GDA M&E) activity to assess the status and progress of all GDA activities as of April 2024. It assesses the GDA programme's status and progress against the impact pathways in the programme Theory of Change.

Although IFI-led activities traditionally fall outside this GDA Midterm Evaluation's scope—being part of the broader ESA-IFI cooperation framework under Space for IDA—it has become evident that segregating these activities fails to adequately capture their interconnected impacts. Consequently, future GDA Evaluations will be expanded to include a unified assessment of IFI-led activities to better reflect their integrated effects. Meanwhile, to bridge this gap, the ESA team has provided essential support by supplying the necessary data for an initial assessment of these activities.

How has GDA's implementation progressed?

The GDA Agile EO Information Development (AID) activities are at the forefront of developing Earth Observation Information Developments (EOIDs) across multiple thematic areas. These activities follow agile cycles to iteratively refine EOIDs to meet partner IFI and CS stakeholder requirements. By the end of Q1 2024, monitoring records showed 124 distinct EOIDs (completed, in progress, and in discussion) serving 68 IFI projects in 65 unique countries. GDA has 46 EOIDs currently in development and 10 EOIDs at the preliminary discussion stage, whereas 68 completed EOIDs have been handed over to the IFI projects for use.

The programme has also implemented other cross-cutting, supporting mechanisms, such as Communicate–Connect–Cooperate (GDA CCC), Advancing and Building EO Knowledge and Capacity (GDA ABC), Analytics and Processing Platform (GDA APP), and the Fast EO Co-Financing Facility (GDA FFF) initiative. However, since most of these initiatives are in the early stages of implementation or value addition, they are not included in this evaluation.

The GDA AID activities are making excellent progress toward their outputs. GDA consortia have been recognised for their expertise and reliability in producing high-quality EOIDs. Their approach is characterised by efficient collaboration, responsiveness, and alignment with IFI specifications. The iterative method of EOID development has been pivotal, allowing for flexible and dynamic adaptation to IFI needs. The GDA programme has focused on both product and process innovation, enhancing the practical application of existing EO methods to meet IFIs' specific needs. However, the perceived risk associated with product innovation sometimes affects EOID usage.



This progress has been facilitated by a number of factors. ESA representatives to the IFIs' facilitation has been instrumental in aligning GDA consortia with the needs of IFIs, improving the impact of information on EO. Cross-participation of various consortia members in multiple GDA activities facilitates knowledge exchange and resource optimisation, while simplified communication, such as single points of contact, improves collaboration between consortia and IFIs.

Alongside this supportive context, some barriers exist. Challenges in GDA AID activities include misaligning agile GDA cycles with traditional IFI project methodologies, leading to operational discrepancies. Mismatches between IFI expectations and consortia capabilities create unrealistic demands, while fixed budgets constrain consortia's flexibility, impacting their ability to meet diverse project needs.

What is the perceived value proposition of EO?

An expected outcome of GDA is for partner IFIs and CS stakeholders to see a clear rationale and potential benefit in using and integrating EOIDs into their work practices and project cycles. Understanding how integrating EOID into IFI working practices is perceived and valued is central to improving and targeting communication with IFI stakeholders.

IFIs value EO for its extensive coverage, rapid data availability, detailed quality, and cost-effectiveness. However, the technical complexity and varying expertise levels among IFI project representatives sometimes moderate this positive perception.

Several aspects contributed to improving IFIs' understanding of the value of EO. Active collaboration in EOID development under GDA AID activities has notably enhanced IFIs' understanding of EO capabilities, exposing them to advanced analytical possibilities. This collaborative approach helps bridge knowledge gaps and facilitates discovering new applications and benefits of EO data.

Despite the recognised value, barriers like inadequate capacity building and the technical nature of EO information pose challenges. The lack of structured capacity-building initiatives and the technical language used in EO communications can intimidate and isolate potential new users, affecting their engagement and appreciation of EO's value proposition. The absence of sector-specific experts as intermediaries further complicates the engagement of IFIs and CSs with EO technologies.

Did the IFIs and CSs use the GDA EOIDs?

EOID usage within IFI projects provides a crucial measure of GDA progress. Usage is defined as *"an IFI or Client State using an EOID created by a GDA thematic area. For example, a CS uses an EOID for ongoing monitoring, or an IFI uses the EOID to inform decision-making and project design."* This assessment examines the extent to which EOIDs are used by IFI projects and factors supporting or hindering their usage.

About two-thirds of the completed EOIDs, that we have data on, were used, mainly to generate analysis and reports throughout the IFI project life cycle. Despite difficulties in tracking post-delivery usage, data from the GDA AID consortia indicates that these EOIDs are mainly used as data sources for analytical documents during the life cycle of IFI projects, supporting planning, implementation, and evaluation. In addition, some EOIDs are used in awareness-raising activities with the CSs or in platforms and web applications, such as in East Africa, where they help monitor locust movements and assess damage in real time, demonstrating their practical utility in crisis management.



Several factors contribute to the successful usage of EOIDs. Among them is the consortia's ability to flexibly adapt to the evolving requirements of IFI projects. This agility, coupled with fostering a sense of ownership and active involvement among IFI teams, has been critical in ensuring that EOIDs are tailored to meet project-specific needs and are perceived as valuable tools by IFI stakeholders.

Despite these enablers, EOID usage faces challenges like data scarcity and a need for more transparency in communicating data constraints and uncertainties. The challenge of engaging new IFI project representatives and the limited time to understand pre-operational-stage EO products also contribute to the underutilisation of EOIDs in IFI operations.

Were there impacts on IFIs and CSs using the GDA EOIDs?

The successful mainstreaming of EOIDs into development projects also depends on demonstrating their actual impacts, defined as *"what we want to observe to be able to say that the objectives of the programme were achieved"*.

The early impact of EOID usage by the GDA AID consortia has shown promising results in enhancing operational efficiency, policy planning, and transparency within IFIs. EOIDs have simplified complex analytical processes, enabling quick and comprehensive insights into environmental issues and policy landscapes. The integration of EOID into IFIs has also increased transparency in project evaluations and independent assessments, supporting decisions based on robust and current data.

IFI representatives reported that the extended use of EOIDs is expected to have future impacts on operational processes and policy formulation within IFIs. Innovative applications of EOID products are poised to become critical tools in climate resilience and disaster management strategies, as evidenced by their ability to layer essential information and create global datasets for comparative analysis across regions. These capabilities underscore the potential of EOIDs to transform the effectiveness and scope of IFI projects, contributing to more informed and strategic decision-making in development contexts.

Did the IFIs invest their own resources to mainstream the GDA EOIDs?

GDA's goal is *"mainstreaming the use of EO into development operations"*, also defined as *"the process of making EO information start to be considered normal in the planning and provisioning of financial resources and operations, of all relevant programme phases, of IFI development assistance projects"*. Signals of mainstreaming occur when one of the below is true, either via direct or indirect alignment:

- 1 EO-related products and services integrated within IFI procurements and loans.
- 2 IFI-aligned activities for Capacity Building, Skills Transfer, and EOID Development.
- 3 EOID is being replicated or adopted beyond its initial use cases through IFIs.

The integration of EO technologies into IFI operations is driven by IFI-led EOID promotion and EO's inclusion in project concepts. This indicates a growing trend towards embedding EO into the strategic framework of IFIs. EO's increasing presence in IFI discussions and global forums reflects its rising stature as a valuable tool for development.



With an estimated value of approximately US\$10 million, almost two-thirds of World Bank projects have reported plans to align or have already aligned their geospatial or capacity-building activities with the support they received from GDA AID activities. This highlights a significant intensification of IFIs' investment in integrating EOIDs into their operations.

This alignment is underlined by the inclusion of EO components in the IFIs' major loan agreements valued up to ~US\$670 million, although this figure does not represent funding dedicated solely to EO. Of this, US\$250 million has been approved, with ~US\$420 still under review. Ten successful procurements awarded to GDA AID consortia further highlight this commitment, reflecting a concerted effort to enhance project effectiveness through advanced EO technologies. Note that this figure is not exhaustive, based on interviews with consortia primes.

Did the IFIs invest their own resources to mainstream EO in general?

Analysis from the EARSC Industry Survey indicates a notable rise in EO engagements, with 20% of European EO companies receiving funds from the World Bank, and 35% stating this was an increase from the previous year. The GDA Midterm Evaluation corroborates this with evidence of increasing EO mentions in IFI project documents and procurements, suggesting a robust integration of EO technologies in development projects.

The mainstreaming of EO technologies is further supported by the broad adoption and planning within IFIs to use EO data for enhancing project effectiveness and decision-making. Initiatives like the World Bank's Digital Earth Partnership and the Asian Development Bank's EO for Development and Digital Transformation Initiative exemplify the strategic efforts to leverage EO for developmental resilience and digital transformation.

The IFAD-ESA partnership under the GDA framework illustrates the impactful integration of advanced EO technologies in agricultural projects to improve climate adaptation and resource management. Such collaborations can enhance project outcomes and strengthen IFIs' capacity to target and monitor critical development areas effectively.

What are the barriers to and enablers of mainstreaming EO?

A series of enablers bolster the mainstreaming of EO technologies in IFIs. A critical factor is creating impactful narratives that effectively demonstrate EO's practical benefits, aligning with IFIs' strategic needs. Additionally, the promotion of EO internally within IFIs by champion users plays a significant role in fostering acceptance and integration. Equally important is the alignment of financial resources and strategies within IFIs, which supports the adoption and sustainability of EO technologies.

Despite the progress, several barriers impede the mainstreaming of EO technologies in IFI operations. High costs associated with high-resolution EO services pose a significant challenge, often conflicting with the preference for open-source solutions. Additionally, reliance on consultants and frequent personnel changes within IFIs can disrupt strategic alignment, prioritising immediate project needs over long-term integration of EO technologies. Furthermore, sector-specific focuses and the complexities in mobilising dedicated funds for EO integration create additional hurdles, alongside challenges in securing buy-in from CSs due to mismatches in needs and the unclear economic benefits of satellite technology.

Summary and recommendations

GDA has achieved notable progress, particularly in programme set-up and the development and initial use of EOIDs, with IFIs recognising the value of EO for its comprehensive coverage and cost efficiency. While about two-thirds of the projects supported through GDA AID activities received or are planned to receive direct alignment resources, there's still potential for increased adoption and mainstreaming in IFI operations, indicating a promising future for broader EO integration.

Four themes synthesise the opportunities to broaden and deepen GDA's impact: communication, demand-side testing and co-design, capacity building, and usage and mainstreaming. Eleven recommendations for ESA are proposed under these four themes (see expanded [recommendations](#) →).

Communications

- 1 Coordinated, aligned, and tailored communication evolves to be a driving force in the GDA programme. Communication about GDA occurs on a more extensive and broader scale to a wider group of IFI project teams, including senior leadership, to drive awareness, set clear expectations, and create demand for EOIDs before each GDA launch.
- 2 The communication function should create user-friendly materials to simplify the technical and scientific aspects of EO for IFIs and CS groups in engaging ways. This includes highlighting economic benefits to appeal to these audiences. Additionally, ESA could fund further economic analyses of EO's value for high-impact use cases to enhance its appeal to IFI teams and CS stakeholders.

Demand-side testing and co-design

- 3 Develop Terms of Engagement (as trialled by GDA FFF) between GDA and IFI projects, which can be repurposed in numerous ways to benefit the programme: 1) as a communication tool during programme promotion to clarify expectations; 2) as the basis of data collection for IFI projects as they submit their interest; and 3) as a checklist by GDA consortia and ESA representatives to determine which IFI projects might be higher priority.
- 4 Draft a collaboration agreement at the User Requirement Review (URR) stage and share it with all three parties (GDA consortia, IFI representatives, and CS end users) for iteration before the technology development begins. This ensures that the full functionality of the EOID is understood and agreed upon up front.
- 5 Evolve to more open-ended engagement mechanisms between GDA consortia and IFI projects. For example, select projects for only half of the available resources during the initial 3-month engagement phase, and make the other half available throughout the remaining timeline as opportunities arise. GDA FFF is an example of such an open-ended engagement mechanism.

Capacity building to support usage and mainstreaming

- 6 Additional mechanisms from GDA can be provided to ensure a baseline knowledge of EO across IFIs that engage with GDA, including a summary, introductory presentation by the ESA representative, highlighting the ABC capacity materials and any subsequent EO-accreditation schemes, and introductory webinars (pre-recorded on a Learning Management System [LMS]).



- 7 Work with IFIs to gather institutional-level support to invest in aligned activities. For example, identify potential “pooled” financing mechanisms across multiple World Bank Global Practices and cross-cutting initiatives like the Global Data Facility. This will help allocate individual IFI projects with funding for capacity building.
- 8 Explore whether any staff resources from IFIs could play a similar role to the highly valued ESA representatives in bridging the conversation between all parties, for example, IFI Short-Term Consultants (STC) and/or sector-specific experts who can be intermediaries and have experience in applying and integrating those technologies in their respective sectors. Also, IFI staff seconded to ESA (in a mirror structure to the ESA representatives) would increase co-ownership and open new avenues of collaboration between ESA and IFI teams.

Usage and mainstreaming

- 9 GDA could reduce the number of use cases and IFI project engagements within the existing thematic areas, which would allow more structural, larger-scale engagements with fewer IFI teams.
- 10 GDA consortia should initiate reporting the likelihood of ongoing use and direct alignment for each EOID during the quarterly data collection process with the M&E consortium.
- 11 Recommendation 10 would allow projects to be regularly assessed for continuation to ensure resources are invested in EOIDs with good and long-term usage prospects.

Report structure

Theory of Change

This evaluation—led by Caribou Space—assesses the GDA programme's status and progress against the impact pathways in the Theory of Change, as visualised in Figure 1. A video-based version of the Theory of Change is also [available here](#).

The report structure is based upon the Theory of Change on the following page.

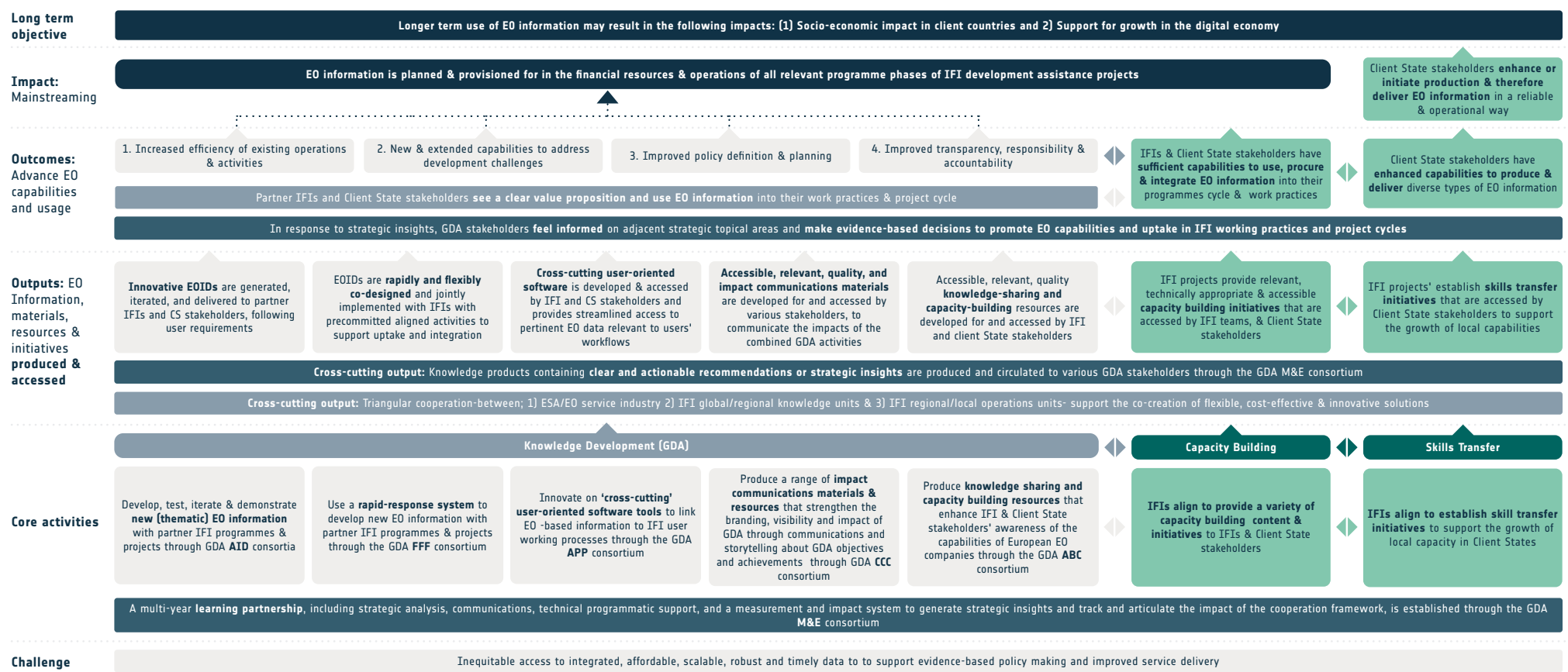
Report section navigation

- 1 **How has GDA's implementation progressed?:** Implementation of the GDA programme, focusing on the status of activities, delivery quality, and factors influencing the achievement of results.
- 2 **What is the perceived value proposition of EO?:** IFI and CS stakeholders' perspectives on EOIDs' value proposition and what enhances or limits their perceived value.
- 3 **Did the IFIs and CSs use the GDA EOIDs?:** Current use of EOIDs developed by the GDA AID consortia within the IFI projects.
- 4 **Were there impacts on IFIs and CSs using the GDA EOIDs?:** Identification of the early impacts that IFIs and CSs have experienced from using GDA EOIDs.
- 5 **Did the IFIs invest their own resources to mainstream the GDA EOIDs?:** Financial commitment from IFIs towards integrating GDA EOIDs into their regular processes and projects.
- 6 **Did the IFIs invest their own resources to mainstream EO in general?:** Assessment of IFIs' overall investment in EO technologies beyond GDA EOIDs.
- 7 **What are the enablers and barriers of mainstreaming EO?:** Factors that facilitate or hinder the integration of EO technologies into IFI operations and strategies.
- 8 **Summary and recommendations:** Reflections on the aggregate achievements of the GDA programme, alongside recommendations.



FIGURE 1: GDA Theory of Change

Global Development Assistance Midterm Evaluation





What is the background of GDA?

Data, which is growing at an unprecedented rate, is becoming an integral part of most people's daily lives. The innovations resulting from creative new uses of data could prove to be some of the most life-changing events of this era.¹

As with most significant innovations, there is an inflection point in ensuring equitable access to data and the capabilities to use data to generate insights that, ultimately, improve lives.

The European Space Agency's (ESA) Global Development Assistance (GDA) programme aims to bridge the awareness, acceptance, and adoption gap—concerning satellite Earth Observation (EO) data—between high-income countries and the Client States (CSs) of International Financial Institutions (IFIs). This is intended to support CSs' equitable access to, use of, and benefit from EO data.

GDA is implemented in partnership with IFIs such as the World Bank (WB), Asian Development Bank (ADB), Inter-American Development Bank (IDB), and International Fund for Agricultural Development (IFAD) under the joint Space for International Development Assistance (Space for IDA) cooperation framework. The Space for IDA cooperation framework is structured around three pillars, aiming to improve the adoption of EO Information Developments (EOIDs) into development assistance programmes (see [Annex one](#) →):

- » **Knowledge Development** (ESA-led GDA programme): Producing high-quality knowledge-sharing resources, materials, and innovative EOIDs.
- » **Capacity Building** (IFI-led)²: For development stakeholders, including IFIs, National Development Agencies (NDAs), and CSs, to support them and increase their confidence and capabilities in using, procuring, and integrating EOIDs in their daily work.
- » **Skills Transfer** (IFI-led): Of existing European capabilities to support the growth of local capabilities and expand adoption of EOIDs, so that a local capacity is established in CSs.

Through these three pillars, the GDA programme and cooperation framework with the IFIs brings together a unique combination of stakeholders to support the co-creation of flexible, cost-effective, and innovative solutions to access, use, and benefit from EOIDs equitably.

Evaluation methods

The evaluation was conducted in three phases: 1) inception, 2) data collection, and 3) analysis. During the inception phase, the evaluation team reviewed the Theory of Change (TOC) and assumptions to update the critical evaluation questions and tools. Data collection focused on specific questions related to the status, delivery, and mechanising of expected and unexpected changes in the programme. The mixed methods evaluation used document review, semi-structured interviews, a survey, and information collected during the GDA industry engagement event on 15 December 2023. The analysis identified key themes from the data collected against the TOC and evaluation questions (see [Annex two](#) →).

1 World Bank, World Development Report 2021: Data for Better Lives, 2021, <https://doi.org/10.1596/978-1-4648-1600-0>

2 The IFI-led Capacity-Building and Skills Transfer activities are termed "aligned activities" to the ESA-led Knowledge Development.



1

How has GDA's implementation progressed?

Summary

This section 1) outlines the status of GDA programme implementation, 2) assesses the quality of delivery, and 3) describes the barriers and enablers to the delivery of high-quality GDA AID outputs.³

The expected outputs of GDA AID activities are to *generate, iterate, and deliver EOIDs* to partner IFI projects, and that these EOIDs are *timely, accessible, reliable, user-friendly, and highly relevant*. These outputs are foundational in supporting EOIDs' value proposition and mainstreaming. Overall, the GDA AID activities are making excellent progress toward their outputs. IFIs rate them highly on timeliness, responsiveness, efficiency, compliance, and accuracy. Both IFIs and consortia highly valued the ESA representatives to the IFIs, the Technical Officers (TOs), the cross-consortia pollination of ideas, and the streamlined communication with the consortia to support the delivery of high-quality EOIDs. Alongside this supportive context, some barriers exist, including tensions with set timelines for engagement, operational discrepancies between GDA and IFI project cycles, and fixed budgets limiting consortia's flexibility. A sample of the findings are highlighted below.

Delivery status and EOID quality

- » Most consortia are highly regarded for their expertise and reliability, enabling the development of high-quality EOIDs.
- » The iterative approach to EOIDs encourages adaptation to user requirements.
- » Despite perceived risks in product innovation, GDA AID consortia's adaptation of EO methods enhances usability for IFIs.

Enablers

- » IFIs and consortia interact more effectively and efficiently with the facilitation of ESA representatives and TOs.
- » Consortia member participation in multiple GDA AID activities promotes a broader exchange of knowledge and optimises resource allocation.
- » Streamlined communication structures, such as a single point of contact, have reshaped consortium and IFI dynamics, fostering more collaborative and efficient relationships.

Barriers

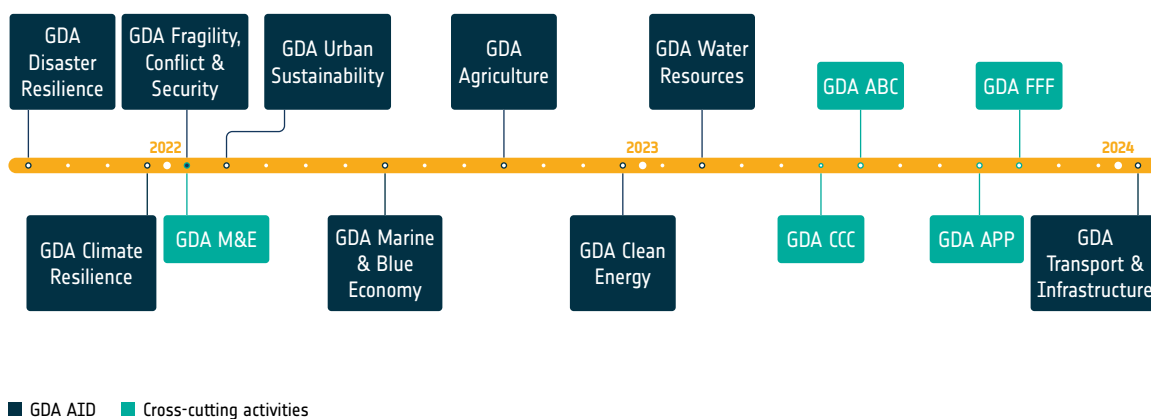
- » The extended engagement period between consortia and IFIs aids in project selection, yet challenges persist in negotiating IFI projects and achieving optimal compatibility.
- » Operational discrepancies between GDA and IFI project cycles, particularly between agile and waterfall project management methodologies, can diminish EOIDs' relevance and impact usage.
- » A mismatch between IFIs' expectations and consortia's capabilities leads to unrealistic demands, hindering the realisation of outputs.
- » Fixed budgets limit consortia's flexibility, impeding their capacity to address diverse IFI project demands effectively.

³ As the cross-cutting GDAs are early in their implementation, they have not been included.

GDA implementation status

The GDA programme was inaugurated by ESA Member States during the Space19+ Ministerial Council in November 2019, with the initial activities commencing in September 2021. As of April 2024, the programme encompasses nine GDA AID activities and five crosscutting initiatives.

FIGURE 2: Timeline of GDA Activities



Each GDA activity plays a critical and unique role in supporting IFIs to mainstream the use of EO in development operations.

- » *GDA Agile EO Information Development (AID)* activities develop EOIDs across nine themes (with two additional ones starting in 2024) following three sequential six-month agile cycles.
 - **Expected output:** Innovative EOIDs are generated, iterated, and delivered to IFI and CS stakeholders, following user requirements.
- » *GDA Fast EO Co-Financing Facility (FFF)* establishes a rapid-response system to integrate satellite EO services into aligned development assistance projects up to a pre-operational level.
 - **Expected output:** EOIDs are rapidly and flexibly co-designed and jointly implemented with IFIs with pre-committed aligned activities⁴ to support usage and integration.
- » *GDA Analytics and Processing Platform (APP)* develops innovative “cross-cutting” user-oriented software tools to link EO-based information to IFI user working processes.
 - **Expected output:** Cross-cutting user-oriented software is developed and accessed by IFI and CS stakeholders and provides streamlined access to pertinent EO data relevant to users’ workflows.

⁴ The term “alignment” is used to mean the dedicated allocation and/or reorientation of already planned activities, manpower, or financial resources by the end user or their supported projects (independent of the ESA contract) to be spent jointly, in complementary manner and in coordination with the use cases to be carried out in the GDA FFF. See GDA FFF Statement of Work.



- » *GDA Advancing and Building EO Knowledge and Capacity (ABC)* produces resources supporting knowledge sharing and capacity building,⁵ for the IFIs to use, to enhance IFI and CS stakeholders' awareness of the capabilities of European EO companies.
 - **Expected output:** Accessible, relevant, quality knowledge-sharing and capacity-building resources are developed for and accessed by IFI and CS stakeholders to communicate the impacts of the combined GDA activities.
- » *GDA Communicate–Connect–Cooperate (CCC)* produces impactful communication materials that strengthen GDA's branding, visibility, and impact.
 - **Expected output:** Accessible, relevant, quality, and impact communications materials are developed for and accessed by various stakeholders to communicate the impacts of the combined GDA activities.

GDA Agile EO Information Development (AID)

Two new GDA AID consortia have commenced engagement with IFIs in the past 18 months. Two additional consortia—GDA Forest Management and GDA Public Health—are scheduled to start in 2024. By the end of Q1 2024, the monitoring records showed 124 distinct EOIDs, including completed, in progress, and in discussion, serving 68 IFI projects in 65 unique countries. GDA has 46 EOIDs currently in development and 10 EOIDs at the discussion stage; 68 have been handed over to IFI projects for use (completed).

Several consortia were scheduled to conclude their contracts within their anticipated 18-month timeframe. These include GDA Disaster Resilience (GDA Disaster), which was due to conclude in March 2023; GDA Climate Resilience (GDA Climate) in June 2023; and GDA Fragility, Conflict, and Security (GDA Fragility) in August 2023. However, the GDA programme incorporates mechanisms for adaptability: Contract Change Notices (CCNs). ESA grants CCNs in various circumstances, including if there is a need for the IFIs to extend the collaboration. In these cases, CCNs are processed 1) when IFIs have exhibited a strong alignment and/or concrete requirements and 2) if a new IFI project becomes involved later in the programme cycle.

GDA cross-cutting initiatives

Most of the cross-cutting GDA initiatives are in the early stages of implementation or value addition. Thus, they have not been included here. Each cross-cutting activity—including the GDA M&E—will be included in the next GDA Evaluation, when a more detailed assessment of their progress and impacts will be implemented.

⁵ By providing an adequate baseline and set of relevant material/guidelines.



GDA AID quality of delivery and EOIDs

The ESA GDA TOC posits some underlying assumptions around the delivery and quality of the products that should be met to promote the inclusion of EOIDs into the working practices of IFIs and CSs. These include the EOIDs being timely, accessible, reliable, user friendly, and highly relevant to IFI programmes and projects. These assumptions are tested as foundational criteria to mainstream EOIDs in IFI operations within the GDA programme processes and evaluation. The evaluation highlights consortia's expertise and reliability in producing high-quality EOIDs, the effectiveness of an iterative approach in adapting to user needs, and the innovation in adapting existing EO methods for enhanced usability.

Most consortia are highly regarded for their expertise and reliability, enabling the development of high-quality EOIDs.

GDA consortia are generally regarded positively by IFI project leads for their expertise, reliability, and adaptability, enabling them to meet complex project demands effectively. Their competence is further strengthened by engaging external consultants—individuals rather than companies—who specialise in converting EO data into usable metrics for their projects when necessary (e.g., GDA AID Fragility). This external engagement was viewed positively by the IFI because it allowed the consortium to complement their teams with skills that could ensure the optimal solution was provided to address the IFI's development challenge. Many GDA AID consortia bring a solution-driven mindset, complemented by robust data expertise and a deep interest in comprehending the unique challenges of each use case. Such an approach has been instrumental in delivering timely and relevant solutions to meet IFI project milestones.

Internally, consortia demonstrate efficient collaboration, often characterised by one partner leading a specific use case while the others provide support. This structure ensures the timely completion of tasks without significant delays in coordination. Moreover, internal collaboration dynamics are remarkably fluid due to pre-existing working relationships between consortium partners.

The efficacy of consortia in addressing project needs is corroborated by GDA AID Task 4 User Feedback questionnaire results, which were gathered from IFI project representatives.⁶ Their collective feedback indicates that the consortia respond efficiently to project requirements, manage project needs, and deliver EOIDs punctually. Furthermore, most of the EOIDs align with IFI specifications, and the accuracy of these products typically meets expectations.

⁶ The findings are based on responses from 31 IFI project representatives.

FIGURE 3: Evaluation of Consortium Performance by IFIs—Responsiveness, Efficiency, Timeliness, Compliance, and Accuracy with IFI Specifications



The iterative approach to EOIDs encourages adaptation to user requirements.

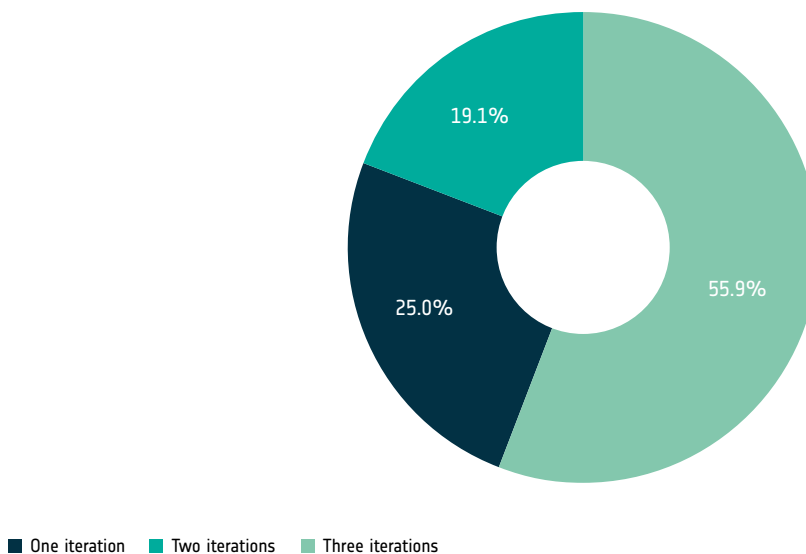
The iterative approach introduces flexibility and dynamism in producing EOIDs. Structured in three sequential six-month cycles, the approach ensures that products are consistently refined to meet IFI requirements. This was “a lesson from the Earth Observation for Sustainable Development (EO4SD) initiative, where we didn't have any cycles, to be more flexible and agile now in GDA” (Christoph Aubrecht, GDA Programme Coordinator, KII 2023). A majority (87%) of IFI project representatives affirmed the consortium's flexibility during development cycles.⁷

“Some consortia have demonstrated much more flexibility on modifying and changing the requirements as the discussion goes [ahead]. For example, some consortia have regular monthly meetings with the users and are willing to address potential changes in needs and requirements that occur along the way. On the other hand, other consortia, sometimes, are less flexible and consider that, once they have registered the needs at the beginning of the iteration cycle, no changes can be considered.”

Alex ChUNET, ESA representative to the WB, KII 2023

However, adherence to these three phases, or iterations, varies by EOID and IFI project. Some EOIDs did not go through all three phases. This happened for various reasons, some related to the product type, which did not require further iteration (e.g., Coastal Erosion (GDA Marine), Urban Asset Exposure Assessment (GDA Urban), and Solar Energy Potential Estimates (GDA Clean Energy)). In all cases, all products were iterated at least once to incorporate feedback provided by the IFIs. Figure 4 shows the percentage of completed EOIDs and the number of times they were iterated before handover.

FIGURE 4: Percentage of Completed EO Products⁸ per Number of Iterations



⁷ Results from the aggregation of Task 4 User Feedback questionnaires to the IFIs, 2023.

⁸ This refers to information products and/or information services that support decision-making assessments. These are produced by processing basic EO imagery and/or data with (often proprietary) value-adding algorithms. A suite of EO products (or services) form an EOID.



Despite perceived risks in product innovation, GDA AID consortia's adaptation of EO methods enhances usability for IFIs.

Innovation in GDA is focused on both products and processes. Different types of innovation exist, including product,⁹ process,¹⁰ and business model innovation.¹¹ GDA consortia have so far mostly focused on product and process innovation. Business model innovation is emerging as the consortia shift from product to service-orientated offerings, which are more often open source. GDA APP is set up to explore further this EO business model innovation.

Process innovation is less about novel concepts and more about adapting, refining, and enhancing existing methods and technologies to better align with user needs and project contexts. By focusing on the practical application of existing innovations, the consortia have delivered EOIDs that are highly applicable and accessible to IFIs and CSs.

"We are not here in GDA to re-demonstrate things that have been demonstrated many times ... I don't think in GDA we interpret innovation as the disruptive tech that puts an AI chip on the satellite. We have other ESA programmes to do that; it's to be interpreted differently ... We don't just demonstrate ready services, we always ask people to customise them to really provide targeted solutions."

Christoph Aubrecht, ESA Programme Coordinator, KII 2023

On the contrary, product innovation can sometimes be perceived as risky, sometimes affecting EOIDs' usage.

"The reality is that—for all the use cases—the more innovative the use case is, the more difficult the uptake will be because World Bank teams will perceive the solution as being riskier."

Alex Chonet, ESA representative to the WB , KII 2023

Enablers for the realisation of innovative user-aligned EOIDs

This section delves into the enabling factors that facilitate the realisation of innovative, user-aligned, and impactful EOIDs.¹² Three core enablers from the evaluation process include consortia-IFI interactions through ESA facilitation, cross-GDA knowledge exchange via partners' multi-activity engagement, and improved consortia-IFI dynamics through streamlined communication structures.

9 This focuses on creating a new product, service, or product feature. Examples range from the internet to the pivoting head of Gillette razor blades.

10 This refers to changes made to make a process more efficient. For example, assembly lines were a breakthrough in manufacturing.

11 This is the transformation of business operations. Ride-sharing platforms, such as Uber or Lyft, are an example of this. They took the taxi and car service companies' business model and altered it to a peer-to-peer, digitised model. Harvard Business School, 9 Examples of Innovative Products, 23 March 2022, <https://online.hbs.edu/blog/post/innovative-product-examples>

12 Please note that the below is not intended to be an exhaustive list of all enablers to generate user-aligned EOIDs, but rather a set of observed enablers cited by the stakeholders during the evaluation process.



IFIs and consortia interact more effectively and efficiently with the facilitation of ESA representatives and TOs.

At the beginning of each GDA AID activity, ESA representatives to the IFIs facilitate the identification of project teams interested in engaging with GDA. Their deep understanding of technical aspects and organisational dynamics has been instrumental in navigating a complex landscape and effectively bringing together disparate groups. This level of engagement and facilitation has led to more effective GDA programme activities. The TOs are also seen as instrumental in communicating with the IFIs and understanding their requirements, given their thematic expertise and understanding. They participate in various meetings and give the consortia their perspective on various issues.

"The support from Alex [Chunet] and Clement Albergel, our Technical Officer, is fantastic. They participated in many meetings with us, being always supportive. Alex organises meetings to support targeted World Bank teams and then, during the discussions, clarifies and smooths things out. Once he detects discrepancies or potential problems, he tries to solve these with clarifications or further examples."

Carlos Doménech García, GDA Climate consortium lead, KII 2023

Consortium member participation in multiple GDA AID activities promotes a broader exchange of knowledge and optimises resource allocation.

The effectiveness of these consortia is further amplified by the fact that several consortium members are involved in multiple GDA activities, which enables cross-collaboration and broader knowledge exchange. For instance, the interconnected nature of themes like water and agriculture often requires a seamless flow of information and strategies between different teams. Having partners participating in both GDA Water and GDA Agriculture consortia fosters this integration. These partners bring valuable insights from one domain to another and identify overlapping topics and synergies. Moreover, this cross-collaboration can optimise the allocation of resources. For example, if one consortium has no margin to work on an IFI project, the other consortium might take up that same project if the thematic areas overlap.

"Water [thematic area] is very close to Agriculture [thematic area] sometimes. So, we have partners that are in the agriculture team, and it helped us to also say: 'This project could maybe go [into the GDA Agriculture consortium].' ... It's very useful to have partners that are involved in different GDAs, because otherwise you wouldn't have the insights that much—you could always ask the other topics [GDA AID consortia]—but it's different if you have a partner that has a lead or a partner function within the [GDA AID activity] already."

Eva Haas, GDA Water consortium lead, KII 2023

Streamlined communication structures, such as a single point of contact, have reshaped consortium and IFI dynamics, fostering a more collaborative and efficient relationship.

Initially, communication challenges between consortia and IFIs arose due to unfamiliarity with GDA's structure and roles, and the different technical languages used. As the programme progressed, these problems were addressed through a natural transition to a single consortium partner, who assumed responsibility after the initial engagement meetings and EOID assignment. This approach established clear roles and responsibilities and designated focal points, simplifying communication.



This improvement in communication has also enhanced the understanding of EO capabilities and applications, aligning expectations and leading to more successful outcomes.

"Once they [the consortium] had the lead organisation, it [the activity] moved very smoothly and very quickly and it became a bit easier for me to understand [the roles], because I had one person that I communicated with and she kind of communicated with whoever on their side needs to be communicated with. And then it became a bit easier for me to understand what the possibilities [of the EOIDs] were."

Paul Prettitore, WB project representative, KII 2023

Barriers to the realisation of innovative user-aligned EOIDs

This section delves into the challenges that have impacted the relevance of the EOIDs and, ultimately, the potential for mainstreaming within IFIs.¹³ The evaluation identified four core barriers: engagement timing, cycle discrepancies, expectation-capability mismatches, and fixed budgets.

The extended engagement period between consortia and IFIs aids in project selection, yet challenges persist in negotiating IFI projects and achieving optimal compatibility.

The engagement phase triggers a comprehensive consultation process, gathering detailed user requirements to identify and refine potential EOIDs. This stage involves an extensive screening of up to 40 potential use cases and multiple meetings to close the selection. Originally, the GDA programme envisioned two weeks to collaborate with IFI projects on their use cases before agreeing to a final set. However, the new GDA AID activities—starting from GDA Water—have a three-month engagement period with the IFIs before implementing EOIDs. This has extended the contracts from 18 to 21 months.

While this has been stated to be extremely useful to the consortia, there were two central tensions within this process.

- 1 A defined period of user engagement can limit the scope for future alignment:** *"We select the projects that have the highest potential for complementarity and alignment. However, the reality is that considering that we have a restricted timeline for the engagement phase to find around eight projects, we do not have as much bargaining power as we would need to ensure that we only pick projects with very high alignment potential. Therefore, even if we don't get exactly what we need, we still need to move forward and find projects to support"* (Alex Chunet, ESA representative to the WB, KII 2023).
- 2 Timing of the consultation period:** *"The three months are not 100% sufficient. It helps a lot, but depending on when you start, especially if it's over the summer, people are not available"* (Eva Haas, GDA Water consortium lead, KII 2023).

¹³ Please note that the below is not intended to be an exhaustive list of all barriers to generating user-aligned EOIDs, but rather a set of observed barriers cited by the stakeholders during the evaluation process.



Operational discrepancies between GDA and IFI project cycles, particularly between agile and waterfall project management methodologies, can diminish EOIDs' relevance and impact usage.

Aligning GDA AID activities with IFI project cycles is a major issue, often leading to discrepancies in timing and operational execution. As stated in [GDA Status Review Year 1](#), “*whilst IFIs have ambitions to shift to more agile development, most IFI projects still follow a cycle that is structured in a traditional, waterfall project management model.*” This misalignment is exacerbated by several factors, including CS bureaucracy and political dynamics, and the IFIs' need to prioritise different aspects of a project, all of which contribute to extended timelines beyond the control of the GDA. For these reasons, some consortia and TOs view strict adherence to an agile three-cycle approach as impractical.

“It is difficult to coordinate the pace required for a good engagement and for a fruitful development process, [this is] naturally dependent on the characteristics and condition of the user and the services that they require, with the regular reporting of projects in a traditional waterfall approach.”

Alberto Alonso Lorenzo, GDA Disaster consortium lead, KII 2023

However, it is important to understand the essence of agility in a broader sense: “*We demonstrate flexibility on adjusting timelines, as long as it increases the engagement efficiency with a certain user*” (Christoph Aubrecht, GDA Programme Manager, 2024).

Furthermore, in some cases, collaborations with GDA AID activities start in the middle of the IFI project implementation phase, when the project has already hired consultants to collect data similar to those the EOID should provide. Checking that this is not the case would be a valuable criterion, within the engagement phase, of suggested Terms of Engagement between GDA and IFI projects. This timing disparity affects the effectiveness and relevance of GDA AID activities in the broader context of IFI programmes, sometimes leading to the inability of the IFI to use the EOID at the time of handover as the time for use has passed.

A mismatch between IFIs' expectations and consortia's capabilities leads to unrealistic demands, hindering the realisation of outputs.

A predominant challenge is a mismatch between the expectations of IFIs and the actual capabilities of consortia. This mismatch often stems from IFIs' perceptions of consortia's services, which lead to unrealistic expectations of results, especially when these expectations exceed the limits of current technological capabilities. For example, there are some cases where algorithm calibration is difficult due to a lack of sufficient ground-truth data. The consortia sometimes struggle with managing these expectations, resulting in unrealistic demands for complete results without considering the practical feasibility and effort required.

Furthermore, IFIs express the need for more specific and advanced information on the products and support the consortia can offer. IFI project representatives suggest that consortia not only introduce technology but also propose practical solutions in line with the requirements of governments or development partners—which would be facilitated by the “IFI sector-specific experts” playing the role of intermediaries (as per [recommendation eight](#) →).



IFI project representatives also emphasise the need for clearer and more transparent communication on the ESA project selection process and criteria to ensure that the right countries receive the support they need. This includes understanding the capacity of CSs and the potential need for a presence of consortia on the ground rather than relying only on virtual engagements.

Fixed budgets limit consortia's flexibility, impeding their capacity to address diverse IFI project demands effectively.

Consortia highlighted difficulties due to the fixed budgets allocated for each GDA AID activity. Financial constraints cause consortium partners to approach tasks cautiously, assessing technical and financial feasibility before committing resources. As the budgets for each consortium member are fixed in advance and do not adjust for workload, tensions arise when multiple IFI projects require the same specialised EOIDs that only one company can provide. GDA FFF was established in autumn 2023 and provides a new mechanism to manage additional, strong IFI demand for specific use cases.

"In the GDA Water Resources cluster, GMV is the sole provider of groundwater services. When you have a fixed and limited budget assigned to each partner and three development projects asking for groundwater information, as has been the case, we have a problem. Given the constraints, we have to prioritise and carefully select a limited number of these projects. In the case of groundwater, we could only select one groundwater use case and had to decline the other ones."

Marc Paganini, GDA Water TO, KII 2023.



2

What is the perceived value proposition of EO?

Summary

This section outlines the EO value proposition as perceived by IFI and CS stakeholders, specifically the general perspectives on EO value and what enhances or limits the perceived value proposition of EO. Understanding how integrating EO into IFI working practices is perceived and valued is central to improving and targeting communication with IFI stakeholders.

An expected outcome of GDA is for partner IFIs and CS stakeholders to see a clear rationale and potential benefit in using and integrating EOIDs into their work practices and project cycles. Our evaluation of the EOID value proposition among IFIs reveals a favourable perception, characterised by their appreciation of EOID's extensive coverage, swift delivery, intricate detail, and cost-effectiveness. Supporting the positive perception of EO, a key enabler identified is the active collaboration between GDA AID consortia and IFIs in developing EOIDs. Engagement in developing EOIDs is crucial in cultivating and reinforcing the value proposition of EO Information. On the other side, two key barriers that temper the full realisation of EO's value were raised. The lack of adequate capacity building in using EO and the technical nature and specialised terminology associated with EO tend to intimidate and alienate potential new users, adversely affecting their engagement with and understanding of EO's value proposition. A sample of the findings are noted below.

EO value proposition position among IFIs

- » The IFIs appreciate the coverage, speed, quality of details, and affordability of the EOIDs.
- » The positive perception of EO's value is occasionally tempered by EO's technical complexity and IFI project representatives' technical knowledge.

Enablers

- » Active collaboration with GDA AID consortia in developing EOIDs is a core mechanism for cultivating the value proposition of EOIDs.

Barriers

- » Lack of adequate capacity building in using EO and the absence of sector-specific experts as intermediaries are fundamental obstacles to IFI and CS appreciation of its value.
- » EO's technical nature and specialised language intimidate and isolate potential new users, affecting their engagement with EO value proposition.

EO value proposition among IFIs

The evaluation found that IFIs value EOIDs for their extensive coverage, speed, detailed quality, and affordability, although the technical complexity of EO and the varying technical knowledge of IFI project representatives sometimes moderate this perception.

The IFIs appreciate the coverage, speed, quality of details, and affordability of the EOID.

IFI project representatives highly value the application of EOIDs for their wide spatial and temporal coverage. This is confirmed by the IFI's collective feedback from the GDA AID Task 4 User Feedback questionnaire. The comprehensive coverage makes it possible to monitor vast, remote, and even conflict regions across countries and continents, facilitating a deeper understanding of market dynamics, land-use changes, and socioeconomic changes.

"Up until more recently, there's been an emphasis on waiting for the conflict to end, and then you go in and do your humanitarian development. But having worked in land and conflict for a long time, we also recognise that it's important to understand what's happening to land tenure during the conflict. ... But getting that type of data information is really hard to do, especially when you can't visit places. So this is where we had the idea to work with remote sensing and big data to try to understand a little bit what's happening on the ground to the extent possible. So, through a combination of looking at satellite imagery to determine whether land is being used, whether housings are being repaired or fields are being cultivated in areas where we know people have been displaced from and reasonably know they haven't been allowed to go back to."

Paul Prettitore, WB project representative, KII 2023

EO added value

The value of the EOID may vary from user to user, but may include:

- » **Affordability:** Along with the increase in commercial satellites, there has been an increase in satellites allowing free and open data access, such as Europe's Copernicus Sentinel missions.
- » **Coverage:** Satellites' global coverage allows monitoring of vast, remote, and even conflict regions across countries and continents.
- » **Frequency:** The time needed to revisit and acquire data for the same location can be daily or every few days, depending on the satellite and ground infrastructure.
- » **Speed:** Increasingly, EO data is available for use just days or even hours after it is acquired, enabling users to receive the EO-derived information they need to act quickly.
- » **Continuity:** The coverage of satellites over the same areas means that a time series of data can be created, which allows consistent monitoring of changes in Earth's key characteristics.
- » **Impartiality:** Observations are derived from satellite instrument measurements, which have a known and controlled range of error and are thus less susceptible to many of the biases detected in other measures of the same phenomena.
- » **Anonymity:** The remoteness of satellites means they can observe phenomena unnoticed on the ground, limiting the privacy risks associated with detecting individuals or accessing Personal Identifiable Information (PII).



Increasingly, EO data is available for use just days or even hours after it is acquired, enabling users to receive the EO-derived information they need to act quickly. Within this context, EO Information's ability to create efficiencies within projects was also cited. In particular, rapid access to data facilitates more efficient and comprehensive feasibility studies.

"Earth observation [...] can really speed up development assessments and the type of decisions we were able to suggest, based on a robust product that may not always be rapidly available to our clients [...] It [the EOID] really provided us a quick understanding of the forest and the degradation and deforestation issues and land management suitability for different analysis."

Ana Elisa Bucher, WB project representative, KII 2023

The EOIDs produced within the GDA were noted to have been characterised by a higher level of detail than other global datasets and products. This attribute is particularly beneficial in regions such as Nigeria (GDA Urban), where EO data's depth and accuracy substantially improve project results' accuracy and relevance.

"In Nigeria, Warri, for example, some of the consultants did use some of our products and found that our products provide a lot more detail than their other global products and other datasets."

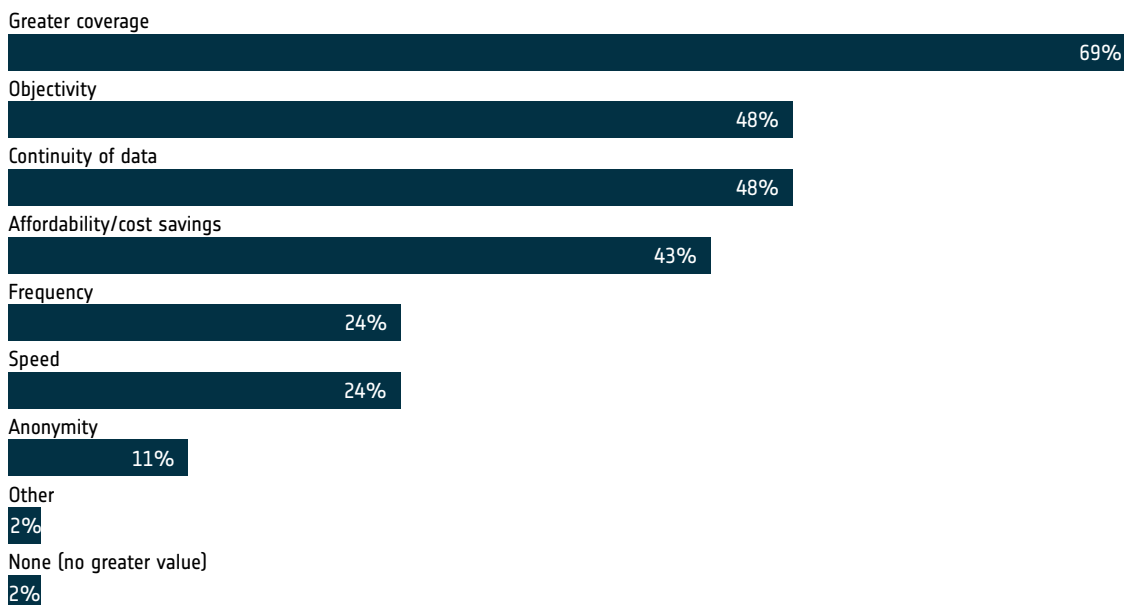
Sharon Gomez, GDA Urban consortium lead, KII 2023

Finally, EOIDs are valued for their affordability, primarily due to an increase in satellites that allow free and open access to data and reducing commercial data costs due to increased competition and lower satellite launch costs. In contexts where project expenses can escalate rapidly, the cost-effectiveness of EO is even more pronounced. This can support a reallocation of limited financial resources to other project components.

"In some fragile or conflict contexts where we work, the cost of security can constitute 30% to 40% of the cost of a project. Providing an assessment of an area, a building, a settlement, etc. with Earth Observation—that is one-tenth of a cost of sending personnel on site, means that we can use those resources for other services."

Elizabeth de Benedetti, ADB project representative, KII 2023

FIGURE 5: Percentage of EOIDs by Reported Added Value



The positive perception of EO's value is occasionally tempered by EO's technical complexity and IFI project representatives' technical knowledge.

Although the value of EO is generally well recognised among IFI project representatives, there are cases where its immediate appreciation is hampered by a lack of a comprehensive understanding of applications and limitations. The GDA ABC Knowledge Hub, launched in June 2023, is set to address this issue. These representatives often recognise the quality of the information provided by EOIDs but encounter difficulties in their practical application, citing the complexity of these tools as a significant obstacle. This complexity can hinder some projects' wider adoption and/or effective use of EO data.

"Two of the respondents had never used geospatial platforms/tools in the past. The one who had said that, while they appreciated the quality of information presented, they often found the tools too complex for divulgation and use."

GDA AID Urban Sustainability Thematic Sector Final Report

Furthermore, effectively communicating all the capabilities and benefits of EO poses challenges. In some cases, EO's technical details and applications have been communicated in an overly complicated manner or misinterpreted by IFIs, necessitating unified and simplified explanations to clarify and improve awareness.

Enablers to realising the value proposition of EO

The evaluation findings¹⁴ show that the production of EOIDs through the GDA AID activities has greatly improved the understanding of EOIDs' capabilities among IFI project representatives. Moreover, it has exposed different IFIs to even more advanced analytical possibilities.

Active collaboration with GDA AID consortia in developing EOIDs is a core mechanism for cultivating their value proposition.

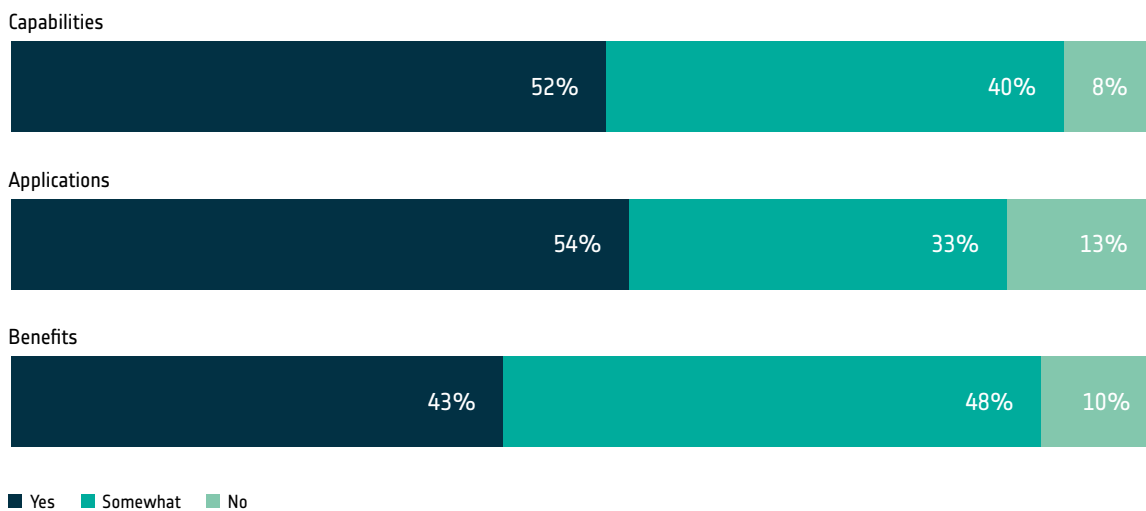
The production of EOIDs under the GDA programme has improved IFI project representatives' understanding of EOID capabilities. Familiarity with EO data and tools varied wildly among IFI project representatives. Some display a high level of technical expertise, and others possess basic knowledge; engagement with GDA activities bridges these gaps.

IFI project representatives are exposed to EO Information's actual applications and benefits during development. This was particularly evident in cases where IFI project representatives had limited exposure to EO data. For instance, some IFIs, initially only familiar with basic EO applications or global datasets, discovered new, advanced analytical possibilities through the GDA programme. These include exposure to high-resolution images, hot-spot analysis, and advanced predictive models.

"I was able to learn every time I had a conversation with GDA experts about new things [...] I didn't know that we could do certain assessments, understand the entire landscape, provide new analysis, or add climate projections. Then it's continuous learning."

Ana Elisa Bucher, WB project representative, KII 2023

FIGURE 6: Percentage of IFI Project Representatives Reporting Improved Understanding of the 1) Capabilities, 2) Applications, and 3) Benefits of Using EO information¹⁵



¹⁴ Please note that the below is not intended to be an exhaustive list of all enablers to improve the value proposition of EO but rather a set of observed enablers cited by the stakeholders during the evaluation process.

¹⁵ Results from the aggregation of Task 4 User Feedback questionnaires to the IFIs, 2023.



Barriers to realising the value proposition of EO

The evaluation findings¹⁶ suggest that inadequate capacity building is a significant challenge, highlighting the need for stakeholders to acquire enhanced skills and knowledge to comprehend EO data use cases effectively. Moreover, EO's technical complexity presents a communication barrier, underscoring the importance of simplifying the presentation of EO data and tailoring it to the specific economic contexts of IFIs for better recognition and application.

Lack of adequate capacity building in using EO, and the absence of sector-specific experts as intermediaries, is a fundamental obstacle to IFI and CS appreciation of its value.

GDA was structured in line with the Space for IDA cooperation principles so that capacity building was expected to be an IFI-led activity. This shift from the approach in EO4SD, where capacity building was embedded into each ESA-funded consortium's tasks, now places the onus on IFIs to align resources for capacity building to support usage. However, there is generally an absence of structured IFI-led capacity building. This has emerged as a barrier to recognising the full benefits of EO, which creates a gap in awareness and understanding, especially among those new to EO technologies.

Capacity building, including practical training and insights into real-world applications, is critical to ensure that IFIs and CSs can understand the technical aspects of EO products and appreciate their practical benefits and applications in various development contexts. Given the size of the IFIs in terms of staff, capacity-building efforts (e.g., using GDA ABC materials) might be most effective when focused on staff that can act as natural bridges between IFI teams and GDA consortia or the wider EO sector (e.g., the sector-specific experts) (see [recommendation eight](#) →).

"I would say that you become more confident on the products when you know how to do them. So, it's implicit that if this capacity building is brought to the process also their own needs could be more explored, and with their time, they could reach out to other topics that they would need in the future or in the present."

Anonymous, WB project representative, KII 2023

The GDA ABC Knowledge Hub is intended to be a key tool in this transition, providing crucial guidance and resources to facilitate these capacity-building efforts.

The technical nature and specialised language of EO intimidate and isolate potential new users, affecting their engagement with EO value proposition.

The technical nature of EO and the specialised language associated with EO often result in considerable communication barriers, leading to misunderstandings and limiting its wider acceptance among IFIs.

"Many GIS/EO experts are not familiar with the development world, and vice versa. They speak different languages ... Our development experts don't understand [what are] for us simple differences, and also with the EO experts sometime think that an indicator will solve all the problems, but they don't think about how it can be plugged into operations."

Oliver Mundy, IFAD project representative, EO for ESG Webinar

¹⁶ Please note that the below is not intended to be an exhaustive list of all barriers to improving the value proposition of EO but rather a set of observed enablers cited by the stakeholders during the evaluation process.



Communicating the value of EO in terms that are familiar to IFIs, and particularly in the language used by economists, is crucial for their understanding and appreciation. For example, presenting EO benefits in terms directly related to cost efficiency, time savings, and improved decision-making can significantly enhance their recognition of EO's practical applications. The sector-specific experts described earlier would play a role in addressing this issue.

"Either they can save money, or they can save time, or they have another benefit. So, showing the benefits for the World Bank side, but also the Client States, in a very 'to the point' way, like [saying] by using that data, we could increase the dam operation by X percent, or we could reduce the time of preparation of the project by three months which saved X amount of dollars."

Eva Haas, GDA Water consortium lead, KII 2023



3

Did the IFIs and CSs use the GDA EOIDS?

Summary

This section illustrates the usage status of EOIDS developed by GDA AID activities for their specific use cases within IFI projects. This enables an assessment of whether the EOID was used as anticipated, and the factors that have supported or hindered the use of the EOID. About two-thirds of the EOIDS developed and completed by GDA AID consortia are used by IFIs. EOIDS show potential in enhancing the efficiency of existing operations and activities, and policy definition and planning within IFIs. Their usage is driven by consortia's adaptability and strong user engagement and ownership, but they face challenges like local data scarcity, mismatched project timelines, and technical gaps within IFIs. Additionally, instances of capacity-building support by IFIs—namely ADB—to government users highlight a growing recognition of the value of EOIDS in development. A sample of the findings is highlighted below.

Evidence of EOID usage

- » Approximately two-thirds of developed EOIDS have been utilised by IFIs, predominantly for report generation inside the IFI project life cycle.

Enablers of usage

- » Consortia's flexibility to adapt to users' dynamic needs supports the usage of EOIDS.
- » Fostering a sense of ownership through continuous dialogue and adaptation emerged as a crucial factor in facilitating the adoption of EOIDS.

Barriers to usage

- » Usage can be inhibited by various factors, including local data scarcity and insufficient transparency about data and methods.
- » The challenge of re-engaging new IFI representatives, compounded by a lack of time to understand how to use pre-operational-stage EO products, leads to underutilisation of EOIDS in IFI operations.

IFI capacity support to CSs

- » Direct IFI support to CSs may not always be required, and examples are limited, but ADB has highlighted emerging cases of capacity-building support to government users.



Evidence of EOID usage within IFI projects' defined use cases

This section examines EOID usage within IFI projects' defined use cases, offering insights into the different ways EOIDS have been applied.

Definition of usage: "A IFI or CS using an EOID created by a GDA thematic area. For example, a CS using an EOID for ongoing monitoring, or an IFI using the EOID to inform decision-making and project design."

Approximately two-thirds of developed EOIDS have been utilised by IFIs, predominantly for report generation inside the IFI project life cycle.

Data gathered from GDA AID consortia highlighted that approximately two-thirds (39) of completed EOIDS were actively used by IFIs or CSs. It is important to note that the information was collected through GDA AID consortia who were not always able to provide the information, as they do not always receive feedback after delivering the EOID. Indeed, for 8 EOIDS information on use was not available; these cases are excluded from the sample of analysis. Among the completed EOIDS for which information was available, it was reported that 32% were used for analysis and reporting (19 EOIDS), 18% were used for awareness raising with the CS (11 EOIDS), and 15% for operational purposes (9 EOIDS). The remaining 35% were not used (21 EOIDS).

Most of these EOIDS were used primarily as data sources for analytical documents across various stages of the IFI project life cycle, encompassing essential support for project planning, implementation, and evaluation. This utilisation is integral to the operational activities of IFIs, supporting strategic decisions and facilitating project progression. Other EOIDS were used to create platforms and web applications, such as in East Africa, where EO data facilitated live monitoring of locust movements and damage assessment, showcasing their utility in real-time crisis management (see [Case study 1](#) →).

Enablers to EOID usage within IFI project-defined use cases

The evaluation noted several factors that lay the foundations for usage—see [GDA AID quality of delivery](#) →—including consortia's expertise, innovation, and reliability in producing quality EOIDS and clarity on the applications and benefits of EO Information. Alongside these foundational enablers, this section examines other factors that were noted to support the usage of EOIDS, namely the consortia's agility in accommodating IFIs' requests. This is crucial for aligning EOIDS with IFIs' specific needs and sense of ownership.¹⁷

Consortia's flexibility to adapt to users' dynamic needs supports the usage of EOIDS.

The flexibility in developing EOIDS plays an important role in facilitating EOID usage. This adaptability allows consortia to tailor their solutions to the specific needs and challenges of various IFI projects, thus enhancing EOIDS' relevance. Some consortia have demonstrated exceptional flexibility, adapting to changing needs during development. This agile approach has proven effective in exploratory or innovative projects where needs and requirements can change rapidly.

¹⁷ Please note that the below is not intended to be an exhaustive list of all enablers to enhance EOID usage and impact but rather a set of observed enablers cited by the stakeholders during the evaluation process.



"The energy consortium has been extremely flexible, allowing World Bank teams to feel fully empowered and explore different avenues: they've tried different things, they've seen what works, what doesn't, and now the World Bank is getting closer and closer to identifying a way they can scale up the tools that we have developed and push them forward. So, this has been a very successful approach."

Alex ChUNET, ESA representative to WB, KII 2023

Fostering a sense of ownership through continuous dialogue and adaptation emerged as a crucial factor in facilitating the adoption of EOIDS.

The sense of ownership and investment is crucial for IFIs to effectively integrate and utilise EOIDS in their operations. When IFI teams are continually involved in the conversation, they have a stronger sense of contribution and control. This approach is essential for IFIs to perceive the project as something they are actively managing, even if they are not the core funders.

"It is not only because we're flexible in addressing their need, which allows to potentially have something that is more tailored, but also because that allows them to feel more empowered and ownership, which then eases the mobilisation of complementary resources to push this forward."

Alex ChUNET, ESA representative to the WB, KII 2023

"Some of the [IFI project representatives] mentioned that they felt like the support we're providing is not really something they can really influence easily and that they feel like they are just a third party that's somehow benefiting from it. This is something we absolutely want to avoid as we actually want them to feel like they own it and manage it to some extent, even if they are not funding it, which implies fostering continuous communication."

Alex ChUNET, ESA representative to the WB, GDA industry engagement day, 15 December 2023

Barriers to EOID usage within IFI project-defined use cases

Sometimes, despite the consortia proving to be flexible and compelling, challenges such as timeline mismatch, data scarcity, and technical hesitancy still impact usage.¹⁸ This emphasises the need for strategic solutions to enhance the usage of EOIDS by transforming these barriers into enablers and maximising the prospect of mainstreaming.

Usage can be inhibited by local data scarcity and insufficient transparency about data and methods.

While some IFI projects have effectively integrated EOIDS to improve planning and monitoring, about one-third of them have encountered some challenges to their utilisation. In addition to the mismatch of implementation timeframes, detailed in [GDA AID quality of delivery and EOIDS](#) → section, others include:

¹⁸ Please note that the below is not intended to be an exhaustive list of all barriers to enhancing EOID usage and impact but rather a set of observed enablers cited by the stakeholders during the evaluation process.

Data scarcity: A recurring challenge is the lack of detailed local datasets, which are crucial for creating accurate and relevant EOIDs. This scenario is common in countries with scarce data resources, and existing data may be outdated or insufficient for comprehensive analysis. Difficulties in data sharing from IFIs and CSs, whether due to logistical or regulatory challenges, may further complicate the situation in these cases. EOID development may be delayed, causing a time mismatch (as mentioned earlier). Alternatively, it may proceed without local data, resulting in lower accuracy and the risk of not being used in the project due to irrelevance.

"[The EOID] is supplied for West Africa, where there is a lack of field data on plastic inputs to rivers. Therefore, the model could not be run with real data—it was run with a set of theoretical data that are not very realistic/representative of the real situation. [...] As real data could not be put in the model, application in an operational context will be very limited for us."

Sarah Jung, WB project representative, KII 2023

"We don't have the micro catchment areas. What are we supposed to analyse if we don't have them? So, all these essential information is actually missing from our side."

Anonymous, IFI project representative, KII 2024

Lack of transparency and contextual understanding: When EO company providers do not communicate the constraints and uncertainties associated with their data and methods, they risk being misapplied by end users. This problem is further exacerbated if the uncertainty estimates of a product are not in line with user reporting requirements. Such an oversight can result in EOIDs being underused or ignored.

"If you don't know the context of use of the information, you might think that you have delivered a great asset. But if you have not been transparent enough or the way you have, for example, estimated uncertainties of your product does not comply with reporting requirements, then that's when you get frustrated because people end up not using your product."

Naikoa Aguilar-Amuchastegui, WB project representative, KII 2023

The complexities of initiating engagements with new IFI project representatives, compounded by a lack of time to understand how to use pre-operational-stage EO products, leads to underutilisation of EOIDs in IFI operations.

Although GDA AID requirements emphasised prioritising "high-impact, high-feasibility" engagements, some consortia perceived that they were required to establish new engagements with new IFI project representatives, moving away from leveraging established connections and awareness from previous programmes such as EO4SD. This approach results in a restart of the awareness-raising process, with a negative impact on the depth and speed of EO future mainstreaming in IFI projects.

Moreover, busy schedules and existing workloads impede the ability of IFI teams to dedicate sufficient time and resources to understand and effectively utilise EO data.



"Just because it's [the support coming from the GDA programme] free, it doesn't mean that people [IFI project representatives] would jump on it, because the valuable resource is actually the time of the senior people. So, they get their attention to get their time on it."

Anonymous, IFI project representative, KII 2024

Prepackaged, standardised analytical products for geospatial data are crucial for streamlined integration into various projects.

"A key challenge in using Earth Observation data is that there is so much of it that still at R&D stage that it's not very clear what types of analytical work ... you can do and what you cannot do. That means that at the World Bank—where a lot of work is quite standardised and trying to be packaged in a certain way, you do a feasibility study about X, so you do something about Y—it's difficult to develop standardised analytical products for the geospatial space."

Anonymous, WB project representative, KII 2023

Support for CS stakeholders in EOID usage

The programme TOC recognises that IFI teams' support may be necessary for CS stakeholders to use EOIDs effectively. These IFI-led activities are outside the scope of the GDA Midterm Evaluation. They are part of the broader assessment of the cooperation framework between ESA and the IFIs under Space for IDA.

However, it became apparent that this separation does not fully capture the integrated impact of these activities. Therefore, moving forward to next year, we will conduct a unified evaluation that includes a more comprehensive assessment of IFI-led activities. We will ensure a more integrated and in-depth analysis of the support provided to CS stakeholders within the broader context of ESA and IFI collaboration.

Direct IFI support to CSs may not always be required, and examples are limited, but ADB has highlighted emerging cases of capacity-building support to government users.

While some IFIs support GDA-implemented EOIDs in CSs, especially within the GDA Disaster Resilience consortium, such instances are relatively few. Limited evidence can be attributed to the nature of EOIDs, primarily aimed at IFIs as end users, rather than CSs.

For example, in Bangladesh the ADB organised a workshop on subsidence and flooding for local municipalities and is planning capacity-building activities (see [Case study 2](#) →). Another notable case is that of Georgia, whose coastal zone management plan is supported by ADB with support from GDA Climate. The data produced by this initiative is intended to be used by the Georgian government. This collaboration includes a preliminary capacity-building proposal to improve the ministry's ability to develop local-scale wave and shoreline evolution models for coastal protection.

Case studies

CASE STUDY 1

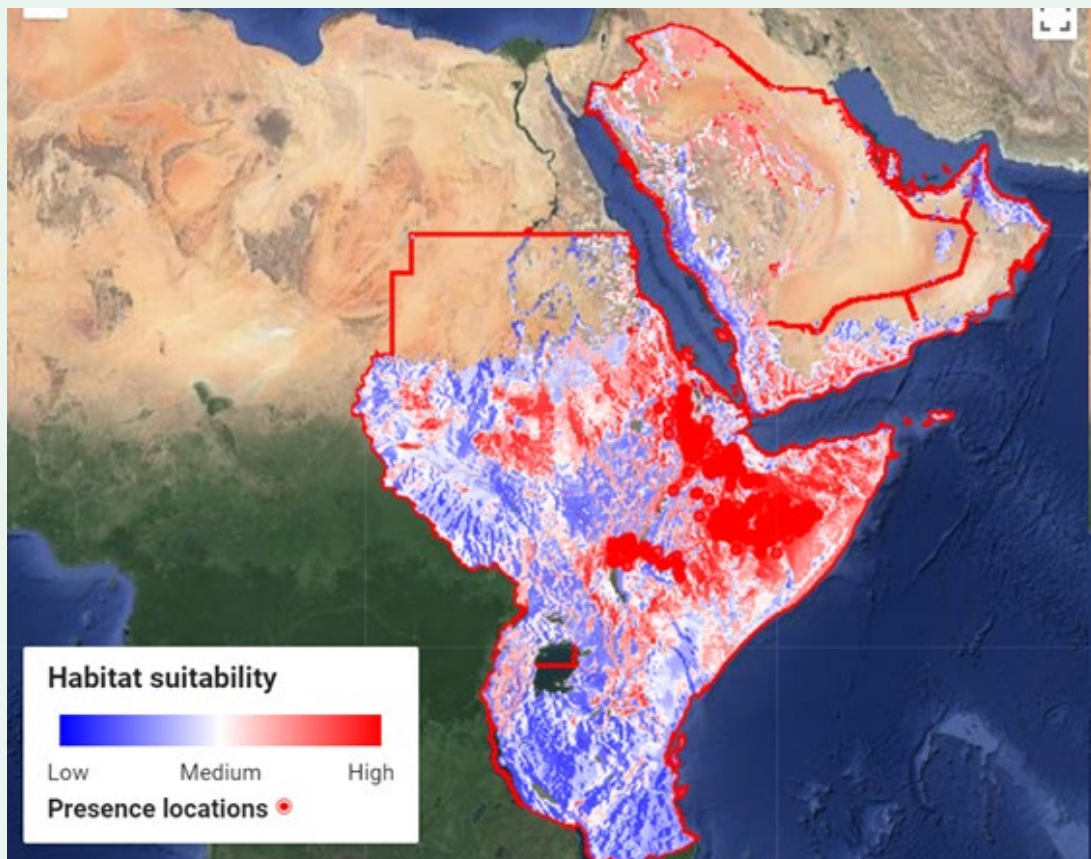
EOID successful usage

GDA Fragility, Security, and Conflict: Desert locust monitoring in East-Africa using EO¹⁹

East Africa's severe locust infestation from 2019 to 2022 underscored the need for better monitoring and early response mechanisms. In collaboration with the WB and the Intergovernmental Authority on Development (IGAD), GDA Fragility activity developed a satellite data-based desert locust monitoring service to track breeding and assess crop damage.

The solution consisted of two services using Google Earth Engine. The first used a machine learning model to predict locust breeding grounds, incorporating various meteorological and satellite datasets. The second focused on mapping crop damage through time series analysis and change detection methods. These services were designed closely with IGAD, ensuring relevance and scalability.

FIGURE 7: Habitat Suitability of Desert Locust for East Africa and the Middle East based on a Machine Learning Approach (© VITO Remote Sensing)



¹⁹ GDA, Desert Locust Monitoring in East-Africa, 22 June 2023, <https://gda.esa.int/story/desert-locust-monitoring-in-east-africa/>



The locust habitat suitability, damage classification and statistics, and crop type maps are currently employed by IGAD in their planning and implementation of pest control and livelihood restoration, contributing to improving locust outbreak prediction and crop damage assessment in East Africa. These operational services are a critical enhancement to data-driven regional food security and hazard awareness decision-making.

"They are currently employing our layers produced in terms of the damage assessment as a consequence of the locust invasion as well as the egg breeding layer to understand the potential zones that may be affected by the locust due to the egg-harvesting process in specific areas ... This is something that is very relevant for us to see something promptly invested in ongoing activities from the IFI end users."

Luisa Bettili, GDA Fragility consortium lead, KII 2023

By accurately predicting locust breeding grounds and assessing crop damage using advanced satellite data and machine learning models, these services have enabled IGAD to implement timely and effective interventions, minimising the impact of locust invasions on agriculture and livelihoods in East Africa. The co-design approach with IGAD has ensured the services' relevance and scalability, while ongoing testing and evaluation aim to further refine these tools for operational efficiency. This proactive response to a significant agricultural threat illustrates the potential of EO technologies to support critical development challenges, enhancing the resilience of vulnerable communities against climate-related hazards.

"At IGAD we base our decision-making on food security and hazards based on evidence generated from data and other information layers [...] The desert locust mapping services are bringing in knowledge from research and data integration capabilities to service IGAD's co-chaired food security network who are not only interested in early warning and early action, but also on level of damage and food security impacts the transboundary pest cause. This is needed in the planning and implementation of interventions in pest control and livelihood restoration after a crisis."

Kenneth Kemucie Mwangi, CS project lead and early warning expert, IGAD, 2023

CASE STUDY 2

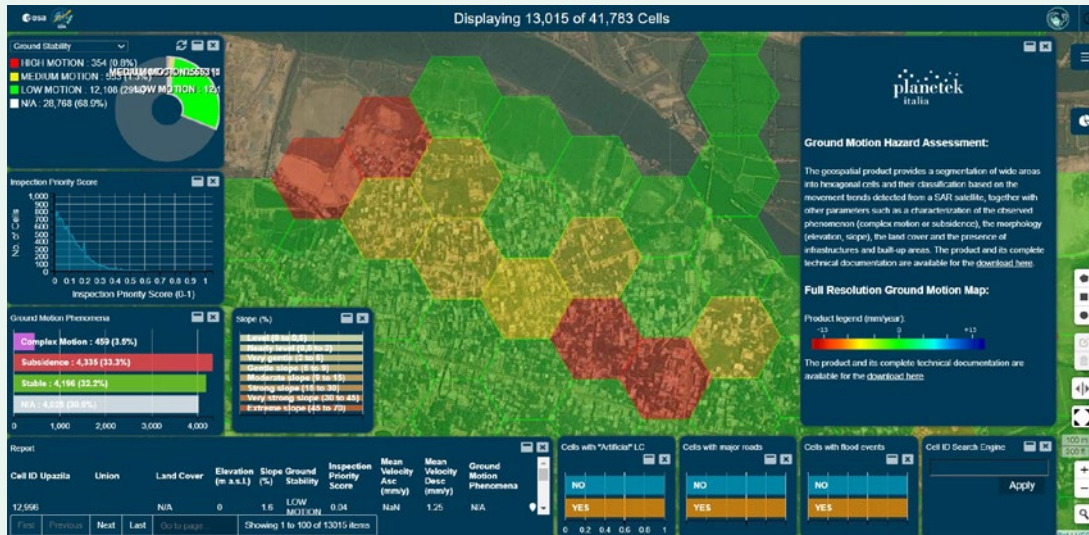
Supporting CS stakeholders in EOID usage

GDA Disaster Resilience: ADB-Bangladesh geospatial indicators for water management improvement

In Cox's Bazar district, Bangladesh, the ADB and local government grappled with challenges in water resource management amid climate change and natural disasters. Key concerns included safeguarding against flood damage, understanding seasonal water variations, and mitigating risks of land movement in densely populated areas.

The GDA Disaster Resilience consortium developed specific algorithms for EO platforms to address these challenges. These platforms processed EO data to generate essential geo-analytical information on natural hazards in Cox's Bazar. The products assessed land movement risk, mapped seasonal trends in surface water bodies, and identified flood-prone areas.

FIGURE 8: The Rheticus® Platform's Ground Motion Hazard Assessment for Cox's Bazar²⁰



In 2024, the ADB initiated plans for capacity-building activities targeting various government departments in Bangladesh. These activities aim to enhance understanding and practical application of EO products at the operational level. Though yet to be implemented, the capacity-building activities intend to raise awareness of EO product utility among government agencies. Government departments have expressed a strong interest in disseminating the benefits of these EO products to a wider audience and have requested comprehensive capacity-building efforts to empower all involved departments.

The ADB Bangladesh Resident Mission has specifically mentioned the involvement of the Local Government Engineering Department, which is crucial for providing transport infrastructure in rural areas. This department's participation is pivotal for leveraging EO products in planning and implementing infrastructure development projects effectively.

The effective use and operational integration of EOIDs in Bangladesh are expected to result from ADB's upcoming capacity-building activities. The assumption is that targeted training will empower local government agencies to use these tools for informed decision-making in disaster risk reduction, climate adaptation, and infrastructure planning.

²⁰ The figure shows the interface of the Rheticus® platform for the exploitation of the Rheticus® ground motion hazard assessment product. This product gives a level of concern to each portion of a territory, subdivided into hexagonal cells, based on a full-resolution ground motion map (PS measurements). Each cell includes the natural hazard information connected with the landslide phenomena (like the flooding information derived by the WASDI platform), the geomorphology (slope), land cover, and exposure information (presence of buildings and infrastructure like roads). Through the available filter "Inspection priority score" it's possible to immediately highlight and select the cells located over the areas characterised by the highest level of concern related to the ground motion phenomena. Through the filter "Ground motion phenomena" it's possible to select the cells affected by the phenomena of interest like subsidence and/or complex motion. See GDA AID Disaster Resilience Thematic Sector Final Report

4

Were there impacts for IFIs and CSs when using the GDA EOIDS?

Summary

This section explores insights of the early impacts of EOIDS produced by GDA AID consortia for IFIs. It highlights emerging evidence on EOIDS influencing policy definition and planning and enhanced decision-making capabilities within IFIs. Furthermore, it describes potential future impacts of ongoing efforts and their implications for the future trajectory of projects and their stakeholders. A sample of the findings is highlighted below.

Early impact of EOID usage

- » EOIDS are increasing efficiency of existing operations and activities.
- » EOIDS are improving policy definition and planning.
- » Information derived from EOIDS improved transparency, facilitating clearer evaluations.

Outlook for future impacts

- » The introduction of new capabilities by GDA-produced EOIDS is set to have a significant impact on future operations and planning.
- » The GDA programme's potential for impacting policy and planning is illustrated through diverse EOID applications.

Early impact of EOID usage

The successful mainstreaming of EOIDS into development projects depends also on demonstrating their actual impacts. Given the current limitations in conducting detailed quantitative impact analyses, the GDA's M&E framework relies primarily on qualitative feedback and anecdotal evidence. Impacts resulting from the usage of EOIDS are mainly evidenced by qualitative examples and narratives rather than by rigorous and comprehensive quantitative assessment at the point of use.

Definition of impact: *"What we want to observe to be able to say that the objectives of the programme were achieved."*

This section explores insights into the early impacts of EOIDS produced by GDA AID consortia for IFIs. It highlights emerging evidence on EOIDS influencing policy definition and planning and enhanced decision-making capabilities within IFIs.

EOIDS are increasing the efficiency of existing operations and activities.

Early qualitative feedback from IFIs indicates that products derived from EOIDS significantly improve the efficiency of ongoing operations and activities. These innovative tools are simplifying analytical processes related to ecosystem services, allowing IFIs to gain a quick and comprehensive view of complex environmental issues.



"It [the EOID] really provided us with a quick understanding of the status of the forest and the degradation and deforestation rates. It also helped us understand the land management suitabilities and integrate these layers into different analyses."

Ana Elisa Bucher, WB project representative, KII 2023

In another case, an EOID significantly improved the quality of hazard- and risk-mapping for a coastal infrastructure project (GDA Marine), indirectly modelling operational strategies and offering valuable insights into safe expansion areas for housing and needle projects. This improvement has implications for future development and risk management within the project.

EOIDs are improving policy definition and planning.

The same early qualitative feedback indicates that some EOIDs are improving policy definition and planning. They formed the basis for specialists and economists to integrate the analysis of ecosystem services more effectively, leading to their integration into the design of climate strategies.

"That service was really the basis for a specialist and economist to really integrate analysis of ecosystem services."

Ana Elisa Bucher, WB project representative, KII 2023

Information derived from EOIDs improved transparency, facilitating clearer evaluations.

EOIDs allow independent evaluations to use up-to-date and accurate data, ensuring that evaluations are based on solid evidence. The availability of these datasets reinforces the integrity and accountability of project evaluations. This practice increases the transparency and credibility of evaluations, making them an essential part of the governance of development projects. This transparency is essential to maintain the trust of stakeholders and ensure that interventions can measure their impact.

"This activity ... informed an independent evaluation, you know, the Independent Office of Evaluation. They have used the results."

Oliver Mundy, IFAD project representative, KII 2024



Anticipated impacts

By “anticipated impacts”, we mean the effects resulting from the more extensive usage of EOIDS that are not currently visible but anticipated from feedback from the IFIs’ project representatives. This section describes the future impacts of ongoing efforts and their implications for the future trajectory of projects and their stakeholders.

The introduction of new capabilities by GDA-produced EOIDS is anticipated to impact future operations and planning.

The development of EOID products under the GDA programme has introduced new capabilities and extended existing ones across diverse projects, demonstrating the potential for scaled impact. For example, a representative of the ADB project praised the transformative nature of the EOIDS (Case study 4 →), describing them as potential “game changers” for a wide range of users, including UN agencies. A notable advance is the increased ability to layer critical information on platforms, facilitating comprehensive analysis that unlocks vast application potential.

“For anyone interested in learning about fragility and a nation’s trajectory, the tool, once deployed, should become a game changer. The platform of this ESA-GDA cooperation has a great potential. Because the EO and non-EO data are stacked, it is possible to evaluate some or all of the features at once. Combining different types and sources of data over time will provide incredible insights on how countries have and will evolve in or out of fragility. For this, I believe that this ambitious tool is very promising.”

Elizabeth De Benedetti, ADB project representative, KII 2023

In addition, the creation of global datasets (GDA Climate) was particularly appreciated because it will enable the comparison of counties uniformly, simplifying and enriching the analysis for stakeholders.

The GDA programme’s potential for impacting policy and planning is illustrated through diverse EOID applications.

The GDA programme has demonstrated potential for improving policy definition and planning in various sectors by applying EOIDS. For example, an IFI representative mentioned the potential to inform the bank’s investment portfolio (GDA Disaster):

“There is potential for improving the way earth observation data can inform World Bank lending operations at GFDRR. Only the Global Program on Nature-Based Solution (NBS) for Climate Resilience provides technical support—including geospatial analytics—to about 45 World Bank-financed lending operations, representing a significant investment portfolio. So, in potential, there is a lot of impact.”

Boris Ton VanZanten, WB project representative, KII 2023

In another example, an EOID will indirectly contribute to identifying safe expansion areas and mitigating coastal erosion risks (GDA Marine), thus improving the planning and execution of infrastructure projects financed by development banks. In addition, another IFI representative emphasised how the information provided by the GDA activity can support the monitoring and development of strategies for land tenure restoration in conflict-affected regions (GDA Fragility).



Case studies

Case study 3

Early impact of EOID usage

GDA Climate Resilience: Democratic Republic of Congo's Country Climate and Development Report (CCDR)

The WB's Country Climate and Development Reports (CCDRs) represent a strategic effort to integrate climate change with development initiatives. The CCDR for the Democratic Republic of Congo (DRC) aimed to align climate action with development, improving the country's resilience to climate impacts. Faced with the challenge of rapid and evidence-based analysis, the GDA Climate Resilience consortium provided critical EO-based products, facilitating informed preparation of the DRC's CCDR.

The task of the consortium was to provide the CCDR team with analysis-ready EO and climate data to assess historical and projected changes in land use and biomass in the DRC, a country vulnerable to natural hazards exacerbated by climate change.

Understanding the tight timeframe and the need for immediate analysis, the consortium provided several EO-based products, including aboveground forest biomass datasets, harmonised land-use data, and historical climate model results.

Feedback from the WB team recognised the value of these products in providing a sound basis for ecosystem service assessments and subsequent climate strategy integrations. In addition, the engagement served as a learning exchange, with the GDA consortium gaining insight into the operational needs of IFIs and the WB team appreciating the potential of EO information in development planning.

"[Where] we used the value of the GDA was on an assessment of forest degradation and the understanding of historical trends of deforestation over the Congo, we captured the deforestation and land use change trends to assess economic value of ecosystem services which then was projected in the future with climate projections. [...] that was very useful because first of all, it provided us a quick understanding of the forest and changes in the landscape and management suitabilities for different analysis. With this overall vision, we were able to validate some of the deforestation assessments that were set globally."

Ana Elisa Bucher, WB project representative, KII 2023

"In this flagship report of the World Bank, I think [the benefit] of having GDA tools available at the tip of the hand it's the ability to do robust assessment with Earth Observation technologies and then use such information to build indicators of project sustainability and enhance the abilities of the government to systematically monitor landscape/forest dynamics and associated ecosystem services, in the short and in the long term, to include climate change."

Ana Elisa Bucher, WB project representative, KII 2023

The WB team "reported that they would continue to use the tool in their work and that it worked well from a usability perspective" (GDA Climate Resilience—D5 Thematic Sector Report).

5

Did the IFIs invest their own resources to mainstream the GDA EOIDs?

Summary

This section illustrates the increasing integration of EOIDs into the operational and planning phases of IFI development assistance projects, termed mainstreaming. It highlights how IFI-led promotion and strategic inclusion of EO in project concepts drive this process, evidenced by an increasing trend of EO incorporation in various sectors. The evaluation highlights the significant investments by IFIs in EOIDs, reflecting a strong commitment to improving development outcomes through innovative approaches in geospatial and capacity-building activities. A sample of the findings are highlighted below.

What does mainstreaming mean?

This evaluation defines mainstreaming as *“the process of making EO information start to be considered normal in the planning and provisioning of financial resources and operations, of all relevant programme phases, of IFI development assistance projects”*.

Intention to mainstream the GDA EOIDs

- » EOIDs are included in IFI discussions and global fora, indicating a positive movement towards mainstreaming.
- » The intention to integrate EO technologies across IFI projects is evident, showing the growing interest and versatility of EOIDs for various sectors and regions.

Direct alignment of IFI resources

- » Almost two-thirds of WB projects reported alignment or plan to align their geospatial or capacity-building activities with the support received from GDA AID activities.
- » Significant funding aligns specifically with the Fragility, Water, and Agriculture thematic areas, emphasising resilience and innovation.
- » Several procurement activities won by EO companies in GDA consortia highlight effective IFI collaborations.
- » The GDA programme's influence is marked by the strategic inclusion of EO components in significant IFI loans, enhancing project effectiveness and strategic oversight.

What does mainstreaming mean?

This GDA M&E activity defines mainstreaming as *“the process of making EO information start to be considered normal in the planning and provisioning of financial resources and operations, of all relevant programme phases, of IFI development assistance projects”*.

Signals of mainstreaming occur when one of the below is true, either via direct or indirect alignment:

- » EO-related products and services integrated within IFIs' procurements and loans
- » IFI-aligned activities for Capacity Building, Skills Transfer, and EOID Development
- » EOID is replicated or adopted beyond its initial use cases through IFIs



It is important to note that mainstreaming EOIDs requires substantial institutional change. Thus, in this early stage of the programme, we should see *progress towards* this mainstreaming.

"We will not be able to have full mainstreaming by December 2025. I mean, this was also never the real expectation. We work towards mainstreaming, right? We want to show progress in uptake. And I mean, this takes decades to materialise really fully. It's a mindset change, it's an institutional process change."

Christoph Aubrecht, ESA Programme Coordinator, KII 2023

Direct alignment of IFI resources

This section explores the direct alignment of IFI resources with the GDA programme.

Definition of direct alignment: The *"scale up of the GDA EOIDs delivered, capacity building, or skills transfer activities by IFIs or CSs. This can be implemented by the GDA consortia or others"*.

IFI-aligned activities are outside the GDA evaluation remit and usually evaluated within the Space for IDA framework at a two-year cadence, hence the GDA Midterm Evaluation methodology was not designed to collate all data or critically review alignment progress. However, it became apparent that this separation does not fully capture the integrated impact of these activities. Therefore, moving forwards to the 2024 evaluation, we will conduct a unified GDA Evaluation that includes a comprehensive assessment of IFI-aligned activities.

For this evaluation, Alex ChUNET, ESA representative at the WB, supported Caribou Space in gathering information on direct alignment from the WB projects.

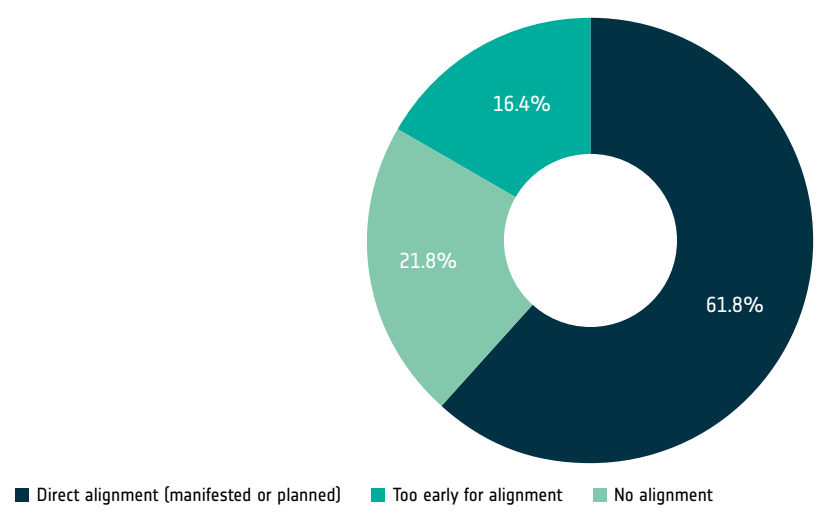
Almost two-thirds of WB projects reported alignment or plan to align their geospatial or capacity-building activities with support received from GDA AID activities.

GDA takes a synergistic approach, combining the development and delivery of tailored EOIDs by GDA AID consortia with capacity-building and skills transfer initiatives led by IFIs to ensure the sustainable usage and mainstreaming of EO technologies.

A survey conducted by Alex ChUNET, supported by DEP's STC Mira Gupta, reveals that many projects backed by the GDA AID consortia engage in complementary activities funded by the WB, encompassing geospatial analysis and capacity-building initiatives. Specifically, approximately 62% of the projects reported alignment or plans to align their geospatial or capacity-building activities with support received from GDA AID activities (see Figure 9).

The direct alignment accounts for about US\$10 million, with an average of US\$250,000 per project. These projects often benefit from the combined efforts of internal WB resources and external consultants, underscoring the comprehensive and integrated approach employed to enhance the effectiveness and scope of GDA AID activities.

FIGURE 9: Percentage of Projects by Nature of Direct Alignment

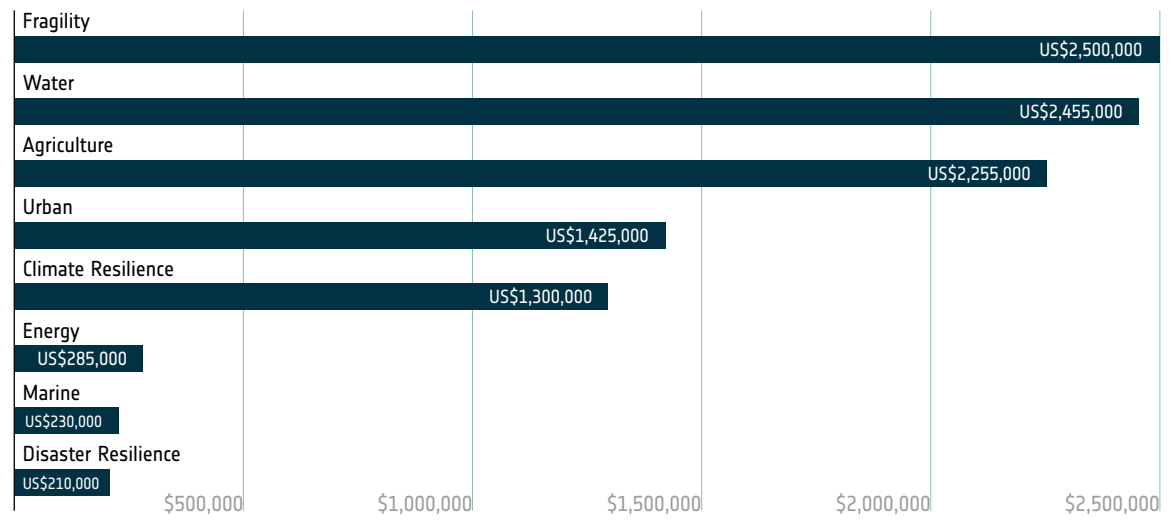


Significant funding aligns specifically with the Fragility, Water, and Agriculture thematic areas, emphasising resilience and innovation.

Looking at the thematic areas, Fragility and Water stand out with the highest financial commitments, with over US\$2 million in actual or planned alignment funding. These sectors focus on critical issues such as emergency response and infrastructure resilience, emphasising the importance of capacity building and geospatial analytics to enhance their effectiveness and sustainability.

Agriculture and Urban Development also see considerable commitments, specifically projects aimed at climate-resilient practices and urban resilience. With over US\$1 million planned or allocated, the Climate Resilience sector focuses on leveraging disruptive technologies to govern public assets more effectively, highlighting a growing recognition of the need for innovative approaches in managing environmental and climate-related challenges.

FIGURE 10: Total Amount of Aligned Resources per Thematic Area





Several procurement activities won by EO companies in GDA consortia highlight effective IFI collaborations.

Procurement activities resulting from direct alignment within GDA activities have shown strong performance, with EO companies linked to GDA consortia securing notable contracts. For example, in 2023, GDA Climate consortium members won contracts for projects including flood risk analytics in South Sudan, deforestation risk assessment in Colombia, and EO satellite processing enhancements in Indonesia. Additionally, GDA Marine and GDA Disaster consortia facilitated impactful projects such as an EO pilot in the Maldives and developing flood recovery in Pakistan. [Annex three](#) → includes a non-exhaustive table overviewing ten procurement achievements by GDA EO companies as collected through the GDA consortia. These successes highlight the effective relationships between the consortia and IFI project representatives, underscoring the collaborations and strategic engagements discussed in the section [How has GDA's implementation progressed?](#) →

The GDA programme's influence is marked by the strategic inclusion of EO components in significant IFI loans.

The influence of the GDA programme is evident in the inclusion of EO components within major loan agreements. This strategic integration of EO technologies is particularly evident in projects aimed at improving coastal defence research, capacity building, and flood management.

TABLE 1: EO-Informed Loan Approvals and Negotiations by World Bank and Asian Development Bank

IFI	Stage	Loan information
WB	Negotiation/review	US\$150 million for the West Africa Coastal Areas Management (WACA) programme in Ghana, allocating funds for EO-informed coastal defence research.
WB	Negotiation/review	US\$4 million for the ELRP/FSRP Capacity Building project component.
ADB	Approved	US\$250 million from the UK-ASEAN Catalytic Green Finance Facility to improve flood management capacity in Indonesia. ²¹
ADB	Negotiation/review	US\$262 million for the production of nation-wide base maps using satellite imagery.

21 ADB, ADB Strengthens Flood Management in Indonesia with \$250 Million Loan, December 2023, <https://www.adb.org/news/adb-strengthens-flood-management-indonesia-250-million-loan>



Case studies

CASE STUDY 4

Intention to include EOIDs in new project concepts

GDA Fragility, Conflict, and Security: Enhancing Country Performance Assessment (CPA) indicators for FCAS classification using EO-based indicators

ADB is confronted with the complex task of accurately categorising countries into Fragile and Conflict-Affected Situations (FCAS) for funding allocation. Traditional binary classification systems (fragile/non-fragile) fail to capture the nuanced distinctions between countries. To overcome this challenge, the GDA Fragility consortium, in collaboration with ADB's FCAS team, has launched a pioneering project to develop a more sophisticated classification system.

This groundbreaking initiative involves the creation of a novel platform that integrates EO data with Open Source Intelligence (OSINT) and big data from diverse sources, including social media. While the project is currently in the development phase, experimenting with various datasets, it promises to significantly improve the classification of FCAS countries.

Although the EOID is not yet operational, the team is optimistic about its potential and trajectory. The evolving platform demonstrates promise for broader applications within ADB's operations, particularly in reshaping financial strategies and project management. It introduces a fresh approach to comprehending and categorising FCAS countries, thereby enhancing decision-making processes related to funding and project implementation.

"The project is exploring the correlation of various aspects of fragility, combining Earth Observation and big data from diverse sources, including social media sentiment analysis. This innovative approach aims to enhance our understanding of the drivers of the fragility and resilience of a region, a country, or a subregion, enabling us to adapt programming, instruments, and projects more effectively. Although we are still in the development phase, the proof of concept is promising. With its combination of information sources, this assessment platform has the potential to be an invaluable tool for development actors and countries alike. Currently, we have integrated Earth Observation and big data information of the Asian and Pacific region; nonetheless, we see and aim to provide this platform to anyone who works in complex environments."

Elizabeth De Benedetti, ADB project representative, KII 2023

The ongoing development of this distinctive platform is currently the top priority. Upon its completion, it has the potential to revolutionise the classification and funding strategies for FCAS countries within the ADB and potentially other international organisations. This marks a substantial advancement in the realm of development and humanitarian efforts.



Case study 5

Direct alignment of IFI resources

GDA Disaster Resilience: ADB strengthens flood management in Indonesia with US\$250-million loan

Indonesia, particularly the northern coastal area of Java Island, faces significant challenges due to flooding and climate change. The strategic economic importance of the region and its vulnerability to flooding have necessitated an effective flood management solution. The ADB has been working to address this problem in collaboration with the GDA Disaster Resilience activity consortium.

The EOID “Subsidence and Flood Diagnosis in Indonesian Cities” was implemented to improve flood management. This solution included subsidence and flood frequency assessments using state-of-the-art algorithms and platforms in five urban centres. The aim was to create an improved exposure database and to develop separate and combined impact analyses for flooding and subsidence.

“Results were presented to the ADB Indonesia resident mission and were received enthusiastically.”

GDA AID Disaster Resilience Thematic Sector Final Report

Most recently, the ADB approved a US\$250-million loan, including funds from the UK-ASEAN Catalytic Green Finance Facility, to improve flood management capacity in Indonesia.²² This loan, focused on the Cimanuk-Cisanggarung and Seluna river basins, is expected to reduce flood risk for over 485,000 people and protect economic centres and infrastructure. The loan documentation explicitly mentions EO-based activities as good practice.

“There is a specific reference and it’s a footnote in the official document about the contribution of ESA that some of the innovation that we want in the project is actually thanks to ESA.”

Paolo Manunta, ADB representative, KII 2023

The successful integration of the EO component into the ADB loan was also due to the efforts of the former ESA representative at ADB, current ADB staff member Paolo Manunta. His understanding of both EO capabilities and ADB’s operational needs was crucial. The project’s alignment with Indonesia’s development plans and ADB’s strategy contributed significantly to its acceptance.

“We have the example of Paolo managing to facilitate the implementation of an EO component in an ADB loan to Indonesia ... This is big progress; we have not had a dedicated EO component in a loan ever before.”

Christoph Aubrecht, GDA Programme Coordinator, KII 2023

With the loan’s approval, there lies a significant opportunity for further involvement of the GDA Disaster Resilience consortium in related Technical Assistance (TA) projects. High tender prospects indicate a growing recognition and demand for EO-based solutions in addressing environmental and infrastructural challenges.

22 ADB, ADB Strengthens Flood Management in Indonesia with \$250 Million Loan, December 2023, <https://www.adb.org/news/adb-strengthens-flood-management-indonesia-250-million-loan>



Case study 6

Direct alignment of IFI resources

GDA Disaster Resilience: Financial alignment in urban green mapping projects in Kinshasa, DRC

As part of the GDA Disaster Resilience activity, a targeted effort was made to map urban green spaces in Freetown, Sierra Leone, to support the WB's Nature-Based Solution (NBS) programme. This task was achieved using Object-Based Image Analysis (OBIA), a more traditional method that involves segmenting satellite images into meaningful objects based on their spectral, spatial, and contextual properties.

While OBIA provided the necessary data for Freetown, the GDA Disaster Resilience consortium, specifically Gisat, simultaneously developed an early version of a Deep Learning (DL) model to map urban green spaces. This model benefited from the OBIA mapping data and results for its training. However, it was not used in the Freetown project due to the WB project team's satisfaction with the existing OBIA results.

At a later stage, as part of GDA Disaster Resilience, Gisat demonstrated the transferability of the DL model for a more extensive scope when the NBS team purchased the solution to map green spaces in Kinshasa. This progress was made possible through collaboration with another contractor, VITO, which coordinated the labelling training samples collected by local stakeholders.

This case highlights the strategic financial alignment within the GDA framework, where direct engagement and funding from a WB entity such as the NBS can catalyse and support targeted EO development projects.



6

Did the IFIs invest their own resources to mainstream EO in general?

Summary

This section reveals an increase in EO engagement and procurement by IFIs, as evidenced by the EARSC 2023 sector survey and by a WB procurement analysis. The WB's Digital Earth Partnership (DEP) and the ADB's Initiative on EO for Development and Digital Transformation exemplify strategic efforts to improve the use of EO in addressing climate change and natural hazards, showing a strategic shift towards the ambition of incorporating EO into IFI operations and planning. Furthermore, new institutional partnerships, such as the ones with IFAD and IDB, are driven by an increasing interest of those IFIs in using EO technology in their development operations to enhance their investment design and resource management.

EO procurement trend in IFIs

- » The 2023 EARSC Industry Survey shows increasing engagement and procurement trends in the European EO service sector with EO projects among IFIs.
- » Increased inclusion of EO in IFI procurements highlights measured progress towards mainstreaming.

Indirect alignment of IFI resources

- » The growth of the WB's Digital Earth Partnership catalyses aligned EO activities, strengthening EO's mainstreaming into IFI operations.
- » ADB's Initiative on EO for Development and Digital Transformation leads the engagement with ESA and accordingly the identification of ADB projects to cooperate with GDA consortia.

Other partnerships

- » The recently formalised IFAD-ESA partnership is boosted by the GDA programme to enhance agricultural development projects with advanced EO and geospatial analytics services addressing challenges related to climate adaptation and resource management etc.
- » The IDB-ESA partnership leverages the GDA programme to increase the efficiency and impact of development efforts in the Latin America and Caribbean region through the wider use and integration of information derived from satellite EO in development operations.



EO procurement trends in IFIs

This section examines the increase in EO project engagement and procurement trends among IFIs, as revealed by the EARSC 2023 industry survey and a corresponding analysis under the GDA programme. The GDA survey and analysis results underline a significant increase in EO-related activities and investments.

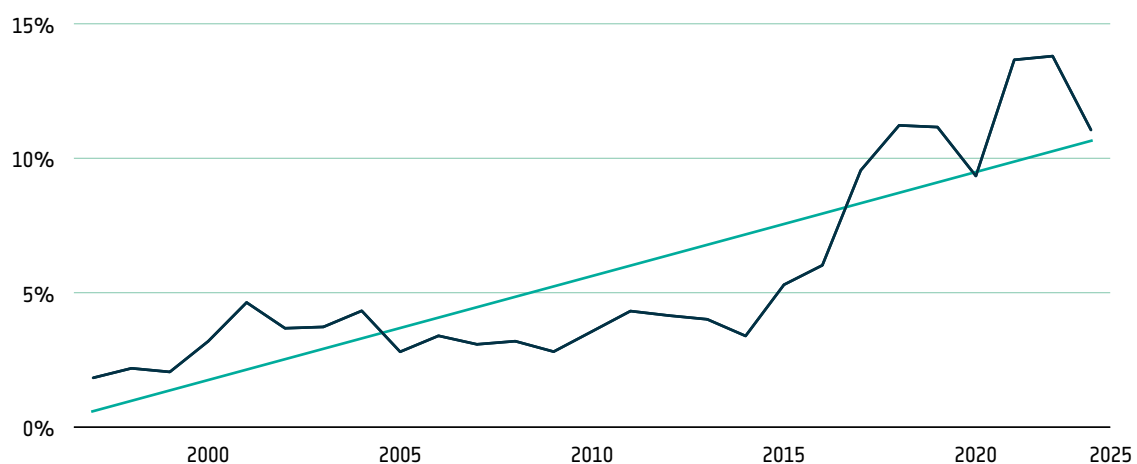
The 2023 EARSC industry survey shows increasing engagement and procurement trends in the European EO service sector with EO projects among IFIs.

Stimulated through the GDA programme, the European Association of Remote Sensing Companies (EARSC) in 2022 included for the first time a dedicated part on IFI engagement in its annual industry survey. An analysis of the 2023 EARSC industry survey revealed that 20% of European EO companies obtained funds from the WB, 7.6% from the ADB, and 2.5% from the IDB. Moreover, 35% of respondents reported an increase in the value of contracts with IFIs compared to the previous year, indicating growing engagement with EO-related projects.

Increased inclusion of EO in IFI procurements highlights measured progress towards mainstreaming.

The GDA M&E activity team had access to insights from an analysis conducted by Alex ChUNET on a dataset that tracked trends in WB project documents featuring EO-related keywords. The chart indicates a rising trend in projects citing EO-related keywords, reflecting the WB's growing interest in integrating EO technology into their operations. Figure 11 shows the share of WB project documents mentioning the intention to use geospatial information including EO; over the past 10 years, the trend has been positive and, despite a decrease in 2023, the share has been above 10% since 2021.²³

FIGURE 11: Proportion of WB Project Documents Mentioning EO-related Keywords with Illustrative Trend Line²⁴



²³ The full list of terms includes EO, geospatial, satellite, satellite imagery, remote sensing, earth observation, geospatial, imagery, and EO4SD.

²⁴ Analysis conducted in January 2024.



Indirect alignment of IFI resources

Definition of indirect alignment: *"Broader IFI-driven initiatives to promote the adoption of EO technologies beyond those originating from GDA".*

The growth of the WB's Digital Earth Partnership catalyses aligned EO activities, strengthening EO's mainstreaming into IFI operations.

The DEP programme is the WB's counterpart, programmatically complementing ESA's GDA programme, aiming to *"enhance the resilience of vulnerable countries and communities to climate change and natural hazard disasters through greater access to and adoption of frontier earth observation tools and services"*.²⁵ It exemplifies indirect alignment with GDA consortia, marking a significant advance in mainstreaming EO within the WB (and potentially as a reference for other IFIs). DEP is enhancing its portfolio of EO and geospatial activities, strengthening the Space for IDA cooperation framework. As Alex Chunet highlighted during the GDA industry engagement event on 15 December 2023, the programme has recently experienced significant growth in funding and scope, including increased investment from the Global Facility for Disaster Reduction and Recovery (GFDRR) and funding for projects targeting the Africa region.

Additionally, the WB's new leadership is demonstrating an inclination towards fostering partnerships that emphasise the use of geospatial and EO Information, further underlining the strategic shift towards integrating these technologies into IFIs' operations and planning (Alex Chunet, ESA representative at WB, Industry Engagement Day).

The ADB's EO for Development initiative improves the coordination of resources, involving ESA and highlighting the value of EO in development.

ADB's EO for Development and Digital Transformation Initiative is set up to support the identification and coordination of existing resources in the Operational Departments to be leveraged for EO, led by the Division for Digital Technology for Development.²⁶ This initiative at the ADB leads the engagement with ESA and identification of ADB projects to cooperate with GDA consortia. The ADB has recognised EO as a key digital technology, elevating its profile and importance within the ADB (Paolo Manunta, ADB representative, KII 2023). This inclusion indicates a growing awareness and acknowledgement of the value of satellite-based observations in advancing development goals.

Other partnerships

The recently formalised IFAD-ESA partnership is boosted by the GDA programme to enhance agricultural development projects with advanced EO and geospatial analytics services addressing challenges related to climate adaptation and resource management.

The collaboration between the International Fund for Agricultural Development (IFAD) and ESA under the GDA programme has advanced the integration of cutting-edge and fit-for-purpose space

²⁵ Digital Earth, Harnessing the new generation of Earth observation services for international development, <https://www.gfdr.org/en/digitalearthpartnership>

²⁶ GDA, ADB launches an internal initiative on EO for development and digital transformation, 13 May 2021, <https://gda.esa.int/2021/05/adb-launches-internal-initiative-ao-for-development-and-digital-transformation/>



technologies into agricultural projects aimed at helping vulnerable food producers adapt to climate change. This institutional partnership (recently boosted through a signed agreement in June 2023), strengthened by jointly implemented projects in several countries, leverages ESA's remote-sensing capabilities to improve IFAD's design and monitoring of key natural resources for smallholder farmers.²⁷

"We want to use EO data in order to understand where are the most vulnerable areas, which are the areas that need most support, and this is what we call geographic targeting ... Other two areas in which we work a lot are M&E and georeferencing procurement of works."

Oliver Mundy, IFAD project representative, EO for ESG Webinar

In Turkey, IFAD and the GDA Climate Resilience consortium have collaborated on a project focusing on slope terracing to prevent erosion and reduce sedimentation in dams. This initiative is part of a broader effort to promote environmental conservation and agricultural sustainability, using EO data to monitor the effectiveness of terracing and changes in the landscape.

"With the GDA AID Climate Resilience support, they had mapped the areas where the project intervened on. Luckily, we have seen a positive change of the three indicators mentioned before [Bare Soil, NDVI, Soil Moisture]. So, we want to understand how to better use these indicators and utilise EO to understand the true extent of certain activities."

Oliver Mundy, IFAD project representative, EO for ESG Webinar

In Sudan, within the GDA Fragility consortium, the partnership focused on the assessment of livestock migration routes amidst ongoing conflicts. The project aimed to facilitate the peaceful migration of herders by identifying and securing corridors that prevent crop damage, thus reducing conflicts between herders and farmers. However, due to the outbreak of war, it was not possible to collect sufficient data on the area and the project did not continue with the use of data from the GDA consortium.

The IDB-ESA partnership leverages the GDA programme to increase the efficiency and impact of development efforts in the Latin America and Caribbean region through the wider use and integration of information derived from satellite EO in development operations.

The recently formalised institutional partnership (partnership agreement signed in December 2023) is following a demand-driven approach where requirements for satellite EO-derived information are assessed within the IDB operational departments to consequently identify, develop, and jointly implement cooperative efforts at activity and regional programme levels.

Those efforts aim to span from leveraging ESA early-stage R&D efforts, via GDA-funded pre-operational engagements, to IDB-facilitated operational uptake and adoption. The partnership supports the use of satellite EO-based information products and services within all phases of development projects including definition, design, implementation, monitoring, evaluation, and impact assessment.

²⁷ IFAD, Spatial technology creates opportunities for vulnerable small-scale food producers as IFAD and ESA join forces, June 2023, https://www.ifad.org/en/web/latest/-/ifad-and-esa-join-forces-to-help-vulnerable-small-scale-food-producers?p_back_url=%2Fen%2Fweb%2Flatest%2Fgallery



Special emphasis is given to mobilising and leveraging development finance instruments and resources dedicated to knowledge development, capacity building, and skills transfer, in a complementary manner to the GDA technical knowledge developments.

The first joint projects are being initiated through the GDA FFF mechanism, fully leveraging an agile approach to optimise initial engagements and coordinated mobilisation of aligned resources.



7

What are the enablers and barriers of mainstreaming EO?

Summary

This section assesses the factors that favour and hinder the integration of EO information into IFI operations. Four main factors were identified: developing evidence-based EO narratives for decision-makers, enhancing integration skills, fostering networks of IFI champions, and aligning financial strategies for EO sustainability. In contrast, the evaluation highlights several barriers, such as high costs, preference for open-source solutions, technical and policy limitations, frequent personnel changes, dependence on consultants, and complexities in establishing trust funds. These factors collectively hinder the integration of EO into IFI projects.

Enablers of mainstreaming

- » Creating a compelling and evidence-based narrative that presents the impact of EO technologies is crucial for engaging with decision-makers.
- » IFIs and CSs need more than EO understanding; practical skills are essential for effective integration and broader government use.
- » Fostering a network of informed and passionate internal champion users is key to integrating EO more deeply into IFI operations.
- » Aligned finances and strategies within IFIs support the mainstreaming of EO.

Barriers to mainstreaming

- » Financial constraints, especially the high costs of high-resolution EO services, are a significant barrier to integrating EO into IFI projects, but open-source solutions conflict with service providers' proprietary models.
- » Securing buy-in by CSs is paramount but challenging due to the mismatch of needs, unclear economic benefits of satellite technology, and the absence of strict policy frameworks.
- » Indirect alignment is constrained by sector-specific focus, such as in the WB's DEP, and challenges in establishing space/EO-oriented Trust Funds within IFIs, compounded by procedural complexities and competitive funding processes.

Enablers of mainstreaming

The evaluation found that the mainstreaming of EO into development operations is driven by four key factors: the creation of a compelling, evidence-based narrative to demonstrate the impact of EO to decision-makers; the improvement of practical skills for effective integration of EO in IFIs and CSs; the promotion of networks of informed internal champions to support EO within IFIs; and the alignment of financial resources and strategies to support EO adoption and sustainability.²⁸

Creating a compelling and evidence-based narrative that presents the impact of EO technologies is crucial for engaging with decision-makers.

To promote the widespread adoption of EO in IFI projects, the focus should be on presenting tangible, real-world applications and benefits aligned with the strategic objectives and practical needs of IFIs and their CSs. The key is to show EO Information's practical benefits and applicability in solving specific development challenges, such as coastal erosion or urban sustainability. IFIs and CSs require clear explanations of how EO technologies can speed up tasks, improve operations, and contribute to strategic decision-making. Beyond simply presenting data and technologies, there is a need to demonstrate how EO methodologies can significantly advance existing work without overstating capabilities. However, careful communication is needed to avoid raising unrealistic expectations.

"Rather than information about technology itself, we appreciate proposals [for] how such technology could improve or expedite our tasks. So that kind of proposal could facilitate future collaboration over our projects."

Kaoru Kashara, ADB project representative, KII 2023

"It would be good to formulate a good hypothesis for using EO indicators: What is the intervention about? What changes do we expect? What variable do we take to measure it? We really need to understand what's happening in the fields in order to monitor it from space."

Oliver Mundy, IFAD project representative, EO for ESG Webinar

GDA supports this endeavour through its activities, specifically GDA M&E, GDA ABC, GDA CCC, and GDA APP. These initiatives will provide a central repository of EO services, examples, and success stories demonstrating the maturity and effectiveness of EO solutions; see [GDA implementation status](#) → for further detail.

IFIs and CSs need more than EO understanding; practical skills are essential for effective integration and broader government use.

To effectively integrate EO technologies into IFIs' operations, it is crucial to go beyond understanding their value. There is a need for concerted skills-transfer initiatives, which are essential to cultivate the skills IFIs and their CSs need to utilise and integrate EO products into their various practices fully. It is about transforming theoretical knowledge into practical skills, enabling users not only to understand EO, but also to apply it effectively in their specific contexts.

²⁸ Please note that the below is not intended to be an exhaustive list of all enablers to support mainstreaming, but rather a set of observed enablers cited by the stakeholders during the evaluation process.



"The way we operate is not like we want to develop products in the project and then attempt to mainstream them with governments; we want it to be sustainable, designed in collaboration with the government to ensure that there was buy-in from the get-go. If it's climate forecasting, it's not just to benefit project beneficiaries in the short term, but rather should be mainstreamed for Ghana as a country to benefit all farmers in the long run."

Ashwini Rekha Sebastian, WB project representative, KII 2023

Fostering a network of informed and passionate internal champion users is key to integrating EO more deeply into IFI operations.

Internal advocates, or "champion users", within IFIs play a crucial role in promoting the adoption of EO data. These enthusiastic supporters, deeply engaged with EO technologies themselves, can effectively generate interest and awareness among their peers. Their ability to share positive experiences and personal successes with EO can have a significant impact.

Moreover, disseminating feedback and success stories from existing projects can be a powerful catalyst for mainstreaming EO technology. When peers within the organisation share these stories, they carry more weight and resonate more effectively with the staff. Peer-to-peer advocacy can help overcome resistance and build a compelling case for the practical benefits and successes of using EO information in various projects. Hence, the benefit of the WB establishing the DEP programme as an internal catalyst.

"As we come from outside, it's complicated for them [IFI teams] to see the value of it [the EOID]. But if it's an internal team that is promoting the use of the EO-based services, that [is] quite helpful to promote uptake."

Carlos Domenech, GDA Climate consortium lead, KII 2023

Aligned finances and strategies within IFIs support the mainstreaming of EO.

While GDA does not expect each IFI to establish a dedicated space/EO-oriented Trust Fund, the emphasis is still on *"holistically leveraging development finance [to ensure complementary action and foster sustainable adoption]"* (Christoph Aubrecht, GDA Programme Coordinator, KII 2023). This approach entails identifying and utilising dedicated resources within IFIs for EO services. The commitment of these resources, which may sometimes involve the strategic alignment of existing resources in certain thematic areas, is crucial for integrating EO into these institutions' operational frameworks.

"That means dedicated resources; that can be a new Trust Fund [or] dedicated resources from existing Trust Funds that are channelled towards the use of EO. And it can also be programmatic alignment of other resources, so not space related but related to the thematic domain. And the mainstreaming ultimately is to really integrate in operations, right? But the two previous components, so dedicated new resources and programmatically aligned existing resources, are always used to foster mainstreaming."

Christoph Aubrecht, GDA Programme Coordinator, KII 2023



Barriers to mainstreaming

Stakeholders highlighted a number of barriers to mainstreaming that require deliberate strategic consideration during the GDA programme evaluation. The evaluation found that integrating EO technologies into IFI projects faces hurdles due to high costs, a preference for open-source solutions, and technical and policy limitations. Additionally, frequent personnel changes and reliance on consultants disrupt strategic alignment, while sector-specific focuses and the complexities in establishing Trust Funds further constrain EO adoption.²⁹

Financial constraints, especially the high costs of high-resolution EO services, are a significant barrier to integrating EO into IFI projects, while open-source solutions conflict with service providers' proprietary models.

The high cost of acquiring and maintaining high-resolution EO services is a major obstacle to integrating EO services into IFI projects. IFI project representatives note the high cost of high-resolution imagery required, for example, for accurate urban vegetation detection, with services based on free imagery not meeting model expectations.

Facing a systemic challenge, IFIs need help to allocate budgets for ongoing EO services and are often looking for long-term solutions at no cost due to the absence of funds allocated for the services they support. However, as EO adds value to addressing challenges in IFI projects, funds that were not initially meant to be used for EO could be repurposed. This should include factoring in maintaining a service for a certain period post-project into a cost plan.

"They [the IFIs] have significant budgets in their projects, but they don't usually have a specific budget for that [the EO product/service]. So, they don't have a budget allocated for integrating EO services, instead they have funds reserved for capacity building, or targeted to operations. Even if interested, it is complicated for them to find funds to pay a service provider to continue, under a licence mode or a subscription mode, the service. This is why I always receive a message like 'I want something [a service] that at the end of the day should be free for us because I don't have the way to continue to sustain recurrent payments.'"

Carlos Domenech, GDA Climate consortium lead, KII 2023

IFIs and CSs typically seek open-source solutions to address this issue and ensure broader and more sustainable use. However, this preference often conflicts with the proprietary nature of service providers' models. Such proprietary models can restrict the adaptability and transferability of EO tools to CSs, limiting their modification and application to specific local contexts. This disparity between the traditional, proprietary service delivery model and the expectation for open and accessible EO solutions presents a significant obstacle to these technologies' effective integration and long-term viability in IFI projects.

²⁹ Please note that the below is not intended to be an exhaustive list of all barriers to supporting mainstreaming, but rather a set of observed enablers cited by the stakeholders during the evaluation process.



"The user is going to be a governmental agency or ministry that needs this [the EO service] to be open source. So ... I can support you for the technical development, you [the country] get the funds for the development of the solution, and then the solution needs to be open source for this country to use it themselves. And this is complicated for everyone in the business. As a private company, we would be working per project without expectations of continuation."

Carlos Domenech, GDA Climate Resilience consortium lead, KII 2023

However, as noted earlier, some EO service providers are incorporating business model innovation with more open-source offerings. GDA APP is set up to explore this innovation of the EO business model further.

Securing buy-in by CSs is paramount but challenging due to mismatch of needs, unclear economic benefits of satellite technology, and the absence of strict policy frameworks.

The adoption and long-term integration of EOIDs often depend on the approval and interest of respective CSs (as linked to lending operations). This consensus is crucial for the successful implementation and sustainability of EO components in development projects, i.e., recognising the importance to go beyond the initial interest of the IFI teams.

"Eventually, that's not for the banks to decide. The banks stimulate it [mainstreaming]. But this is done by the countries. Eventually, it's the country's money, it's a loan, right? The Bank lends money, it comes with technical assistance, but it's still the country's money. So, the activities that are implemented in a loan are implemented by the country [and] are also procured by the country. So, getting EO in there requires even more [convincing] work."

Christoph Aubrecht, GDA Programme Coordinator, KII 2023

The lack of direct engagement between EO service providers and CSs may make local stakeholder buy-in more difficult. This indirect engagement model can lead to a mismatch between the information on EOIDs developed and the needs of target CS users. However, when engagement with CSs is present, the challenge may be to translate the benefits of satellite applications into economic value.

"The Bank can contribute to the technical development with their clients' knowledge, then will engage with the CS to motivate or encourage to use the service developed because it's—according to their thoughts—a nice solution for them. They are convinced. But then, the CS will ask you about, 'If I decide to incorporate this, what are my savings? What is the economic impact with respect to my current approach in our procedures?' That's complicated to evaluate. In most cases, we don't have a clear answer for that."

Carlos Domenech, GDA Climate consortium lead, KII 2023

Finally, the degree to which a CS embraces adopting EO services may depend on the project's thematic objective and the corresponding policy frameworks or initiatives required. In sectors such as forestry, countries are bound by numerous conventions (e.g., UN REDD+) that require precise measurements and the communication of specific objectives to specialised authorities. Countries naturally tend to use the most effective solutions, including satellite technologies, to meet these standards in these contexts.



Reliance on consultants and frequent personnel turnover within IFIs often lead to strategic disconnect, hindering the long-term integration of EO technologies.

When IFI project representatives, needing more time or expertise, hire consultants in support of GDA engagements, it often results in a focus on short-term goals rather than long-term strategic alignment. Reliance on consultants for feedback and implementation can lead to a disconnect in integrating EO into IFI strategies, as consultants prioritise immediate project (and individual) needs over EO technologies' long-term adoption and integration. Consequently, this approach conflicts with the objective of achieving long-term, continuous EO integration within IFI operations and strategies.

Even without the involvement of STCs, relying on IFI project representatives to integrate EO into operations poses similar challenges for mainstreaming. Given the rotational nature of IFI assignments, representatives often prioritise immediate, country-specific project goals over long-term sector- or practice-level engagements and EO applications, focusing more on current investments and loans. Additionally, the frequent turnover of representatives disrupts the continuity and momentum of EO integration, resulting in knowledge loss, the need to re-establish relationships, and often starting anew with EO capabilities awareness raising and trust building with each new representative.

"Unfortunately, we have a lot of changes [of staff] in terms of regions, and sometimes they [the IFI project representatives] take that knowledge away and don't leave it with the teams and in the country."

Ana Elisa Bucher, WB project representative, KII 2023

Indirect alignment is constrained by sector-specific focus, such as in the WB's DEP, and challenges in establishing space/EO-oriented Trust Funds within IFIs, compounded by procedural complexities and competitive funding processes.

Indirect alignment efforts complementing GDA, exemplified by the WB's DEP focusing on disaster resilience and climate change, face challenges due to sector-specific orientations and funding limits, restricting EO technology applications to certain areas. Additionally, establishing dedicated space/EO-oriented Trust Funds in IFIs, like the ADB, is complex and hindered by rigorous approval processes for TA projects. This situation is further complicated by the competitive environment within IFIs for project financing, where resources are allocated based on open competition.

"What I think is difficult, is expecting that the ADB can be successful in building a Trust Fund for Earth Observation ... Even a Trust Fund doesn't mean you can mobilise the money easily. In a sense that, to mobilise the money on the Trust Fund, you need to have a technical assistance approved. One solution we have in place is to tap into existing TAs or to apply for direct charge to existing Trust Funds."

Paolo Manunta, ADB representative, KII 2023



8

Summary and recommendations

GDA has demonstrated commendable progress in several areas to date. At the core of its achievements is the substantial volume of activities undertaken. Within 2 years, the programme has successfully implemented many actions, including launching 9 GDA AID thematic areas and 5 crosscutting initiatives involving 68 IFI projects and more than 60 European service providers. These areas have actively engaged with numerous IFIs, and the IFAD and IDB have recently joined having identified the benefits of collaboration with ESA under the GDA programme. Under EOID co-design and development, GDA has 46 EOIDs currently in development, 10 under discussion, and a further 68 completed for handover. These will support operations across 65 countries. This achievement marks a substantial effort in terms of outputs.

EO value proposition for operations for IFIs is evident, with accolades for the comprehensive coverage, timely delivery, detailed nature, and cost-efficiency of EO Information. Nevertheless, opportunities remain to broaden the appeal and effectiveness of the EO value proposition across IFIs, particularly with those less familiar with EO applications.

Approximately two-thirds of the EOIDs developed and completed have been used as expected. Considering the iterative and co-design process, alongside the time investment, one would expect usage to be nearly full. This rate may reflect initial challenges in selecting supported projects and coordinating and aligning expectations between IFIs and GDA consortia. Of those used as intended, the drivers remain consortia's adaptability, strong user engagement, and co-ownership.

The direct alignment of resources with the EOIDs produced under the GDA programme, characterised by significant investment by IFIs in EO technologies, is evident. Almost two-thirds of WB projects reported alignment or plan to align their geospatial or capacity-building activities with the support received from GDA AID activities to a total of US\$10 million. This alignment is underlined by the inclusion of EO components in IFIs' major loan agreements and projects, which improve project effectiveness and strategic oversight. The successful procurements of GDA AID consortia illustrate the strong partnerships with IFIs, highlighting EO's increasing recognition and integration in addressing major development challenges.

There are clear signs of increased integration and strategic application of EO technology within IFIs. This growing commitment is demonstrated by improved funding and procurement practices, major initiatives such as the WB's Digital Earth Partnership and the ADB's Initiative on EO for Development and Digital Transformation, alongside novel partnerships ESA is adopting through the GDA programme with IFIs such as IFAD and IDB.

There remains a strong potential for more effective and widespread adoption of EO Information in IFI operations. The recommendations below are structured to build on identified opportunities to increase the conversion rate from products developed to utilised, to utilised with aligned IFI support, to mainstreaming, allowing the GDA and partner IFIs to maximise the impact of EO for development operations worldwide in the coming years.

Recommendations

Four themes synthesise the opportunities to broaden and deepen GDA's impact: communication, demand-side testing and co-design, capacity building, and usage and mainstreaming. We propose a number of recommendations in line with these four themes.

Communication

- 1 Coordinated, aligned, and tailored communication evolves to be a driving force in the GDA programme.** ESA (as its own entity and through the GDA consortia) communicates on a more extensive and broader scale about GDA to a wide group of IFI project teams, including senior leadership, to drive awareness, set clear expectations, and create demand for EOIDs before each GDA AID launch. This enhances senior leadership buy-in, catalyses demand, and limits engagement resource investment with misaligned projects.
- 2 The communication function should deploy user-friendly materials that simplify EO's technical/scientific complexity to IFIs and CSs in interactive and engaging methods.** This would also include packaging the benefits in terms that appeal to the IFIs and CSs, e.g., highlighting economic benefits. ESA could fund additional economic analyses of the value of using EO for high-impact use cases to strengthen the value proposition for EO within IFI teams and CS stakeholders.

Demand-side testing and co-design

- 3 ESA could consider drafting Terms of Engagement (as trialled now in GDA FFF), which could be repurposed in numerous ways to benefit the programme:** 1) as a communication tool during GDA programme promotion to clarify expectations; 2) as the basis of data collection for IFI projects as they submit their interest in engaging; and 3) as a checklist by GDA consortia and ESA representatives to determine which IFI projects might be a higher priority to be engaged in a GDA AID activity. This would narrow the project pipeline to a cohort more likely to collaborate, adopt, and promote the EOID successfully. The Terms of Engagement may include:
 - EOID leverages European and Canadian space assets and missions, utilising free or low-cost data.
 - EOID prototype can be delivered for feedback and iterations within two to three months.
 - Projects should identify an Area of Interest (AOI) with end users who can derive lasting benefits.
 - EOID aims to balance innovation with user needs and current capabilities.
 - IFI and CS representatives understand their engagement level and data contributions, ensuring timely data receipt.
 - It is crucial that the IFI project team commits to resource allocation for long-term EOID usage and to a timeframe for this support.
 - IFI and CS representatives are proactive in addressing issues to avoid delays.



- 4 **A collaboration agreement could be drafted at the User Requirement Review (URR) stage and shared with all three parties (GDA consortia, IFI representatives, and CS end users) for iteration before the technology development begins.** This ensures that the EOID's full functionality is understood and agreed upon up front and is acknowledged by a confirmation email from the IFI project representatives. This collaboration template may include the following:
 - o A clear description of the EOID and the practical solutions and intended benefits it supports for the CS/IFI.
 - o The inputs expected from all parties, including CSs, include data from IFIs/CSs, feedback, and other information.
 - o The estimated time frame for development cycles and the periods during which the consortium will collect feedback from IFI and CS users.
 - o The resources/skills required for sustained usage of the EOID should be clear and tailored to the EOID up front.
 - o An assessment of current IFI and CS capacity and what skills/competency gaps need to be filled for usage.
 - o Agreement for all three parties to schedule and hold an initial design session to agree upon the full user requirements and build trust and co-ownership of the EOID.
- 5 **Evolve to more open-ended engagement mechanisms between GDA consortia and IFI projects.** For example, select projects for only half of the available resources during the initial three-month engagement phase, and make the other half available throughout the remaining timeline as opportunities arise. GDA FFF is an example of such an open-ended engagement mechanism.

Capacity building to support usage and mainstreaming

- 6 **Additional mechanisms from GDA can be provided to ensure a baseline knowledge of EO across IFIs that engage with GDA,** including a summary introductory presentation by the ESA representative, highlighting the ABC capacity materials and any subsequent EO-accreditation schemes, and introductory webinars (pre-recorded on an LMS). To promote broader understanding, IFI staff outside GDA activities could access tailored and concise courses to gain a foundational understanding of EO technology for specific use cases. This could support a pipeline of other IFI projects that could become EO Information users in the near future.
- 7 **ESA could work with IFIs to gather institutional-level support to invest in aligned activities.** For example, it could identify potential "pooled" financing mechanisms across multiple WB Global Practices and crosscutting initiatives like the Global Data Facility to allocate individual IFI projects with funding for capacity building as aligned financing for the GDA programme. This activity could be funded through existing Trust Funds such as DEP or low-value contracts for GDA AID consortium partners or dedicated Short Term Consultants (STCs) from the IFIs.
- 8 **ESA could explore with the IFIs whether IFI staff resources could play a similar role to the seconded and highly valued ESA representatives in bridging the conversation between all parties.** For example, IFI STC support and/or sector-specific experts that can play the role of intermediaries and have experience in the application and integration of those technologies in their respective sector. Also, IFI staff seconded to ESA (in a mirror structure to the ESA representatives), would increase co-ownership and open new avenues of collaboration between ESA and IFI teams.



Usage and mainstreaming

- 9 GDA could reduce the number of use cases and IFI project engagements within existing thematic areas, which would allow more structural, larger-scale engagements with fewer IFI teams.**
- 10 GDA consortia will be asked to report the likelihood of ongoing use and direct alignment for each EOID during the quarterly data collection process with the M&E consortium.** New questions related to this will be included in the data capture forms and discussed during the quarterly meetings.
- 11 Recommendation 10 would allow projects to be regularly assessed for continuation to ensure resources are invested in EOIDs with good and long-term usage prospects.** Based on information provided during the quarterly meetings, GDA consortia and their respective TOs may decide to discontinue use cases that do not meet required collaboration criteria or if IFI project circumstances change and levels of engagement are worse than expected.



Annex one: GDA programme overview

GDA was launched to accelerate impact by fully capitalising on the power of satellite Earth Observation (EO) in international development assistance operations.

The following activities are focused on thematic areas:

- » **Agile EO Information Developments (GDA AID)** will provide EO Information Development (EOID) in response to requirements identified by IFIs and their CS governments in developing countries. These launched over late 2021, 2022, and 2023 and currently focus on nine thematic areas.³⁰

The following activities are crosscutting:

- » **Monitoring & Evaluation and Impact Assessment (M&E)** was launched in January 2022 to monitor, evaluate, and report the impact of GDA on development operations.
- » **Communicate–Connect–Cooperate (CCC)**, or GDA CCC Impact Communication, was launched in May 2023 and aims to strengthen GDA's branding, visibility, and impact through professional strategic communication and visual storytelling.
- » **Advancing and Building EO Knowledge and Capacity (ABC)**, also called GDA Knowledge Hub, was launched in June 2023 and is in the process of defining, designing, and implementing a knowledge hub for GDA.
- » **Analytics and Processing Platform (APP)** was launched in September 2023 and will produce crosscutting user-oriented software and analytical tools.
- » **Fast EO Co-Financing Facility (FFF)** was launched in October 2023. It will establish a financing facility to address EOIDs that existing GDA AIDs do not cover or that target different IFI organisations.

GDA is implemented in partnership with IFIs–WB and ADB–under the joint Space for International Development Assistance (Space for IDA) cooperation framework. Those IFIs are establishing dedicated programmatic structures supporting partnership coordination: the WB Digital Earth Partnership³¹ and the ADB EO for Development and Digital Transformation Initiative.³² These IFIs are aligning activities to complement GDA's technical developments, including:

- » **Scale-up of demonstrated technical developments**, i.e., new EO Information products scaled to regional level that allow a better understanding of EO Information, applications, and benefits of its use.
- » **Capacity Building for development stakeholders**, including IFIs, National Development Agencies (NDAs), and CSs, to put them in a position to use EOIDs (produced externally). This can include programmatic support (e.g., group or one-on-one training or financial support) from an IFI project investment (e.g., training sessions on GDA AID products as part of the GDA contracts are not counted).
- » **Skills Transfer** of existing European capabilities to establish local capacity in CSs to produce and maintain diverse EOIDs reliably and operationally and support local users' usage.

30 ESA, Thematic Areas, GDA AID, <https://gda.esa.int/thematic-areas/>

31 World Bank Global Facility for Disaster Reduction and Recovery (GFDRR), Digital Earth, www.gfdrr.org/en/digitalearthpartnership

32 ADB, Digital Technology, www.adb.org/what-we-do/sectors/dt/main



The GDA AID activities provide EOIDs in response to requirements identified by IFIs and their CS governments in developing countries. These are led by industry consortia consisting of organisations³³ from 14 participating states.³⁴ These consortia are selected via a competitive Invitation to Tender (ITT) process led by ESA. Each consortium then implements its activity within 18 months.³⁵

33 GDA consortia include companies, academia and research institutions, and space agencies.

34 Participating states are Member States of ESA from Europe and Canada that have provided subscriptions to the GDA budget. ESA, Stakeholders, <https://gda.esa.int/stakeholders/>

35 Timeline extended to 21 months for latest thematic areas.

Annex two: Evaluation methodology

To assess progress towards the GDA programme objectives and the ultimate impact on critical stakeholders—ESA, GDA consortia, IFIs, and CSs—an evaluation process was designed to enable all stakeholders to engage with and measure progress throughout the programme to enhance programme responsiveness.

Objective for the evaluation process

There are four identified objectives for the evaluation process:

- 1 Assess the level of outcome realisation.
- 2 Establish a level of causality between outcomes and the GDA programme.
- 3 Identify aspects of strengths and gaps in implementation and the intervention's impact pathway.
- 4 Provide recommendations to address any identified gaps.

Phases of the evaluation process

The evaluation was conducted in three phases: 1) inception, 2) data collection, and 3) analysis.

Phase 1: Inception

During the inception phase, the evaluation team reviewed the Theory of Change (TOC) and assumptions to update the critical evaluation questions and tools. We used evidence to test the steps and assumptions postulated in the TOC. This included the collection and use of data on:

- » Status of programme implementation
- » Assumptions underlying the delivery of outputs
- » Status of output delivery
- » Changes in outcomes
- » Assumptions underlying the achievement of desired outcomes

This theory-based approach forms the basis of the methodology for this GDA Midterm Evaluation.

Phase 2: Data collection

The data collection phase focused on specific questions related to the status, delivery, and mechanism of expected and unexpected changes in the programme. The critical evaluation questions were as follows:

- » **Process:** Activities to outputs.
 - What is the status of the planned activity implementation under GDA to date?
 - Across all stakeholders, have these activities been delivered effectively, efficiently, and to the expected level of quality? Why/why not?
 - What expected/unexpected changes (outputs) have these activities contributed to?
 - To what extent can these changes be linked to the GDA programme?
 - What factors supported or inhibited the 1) delivery of activities and 2) realisation of expected/unexpected outputs?
- » **Value proposition:** Partner IFIs and CS stakeholders see a clear value proposition in using and integrating EOIDs into their work practices and project cycles.
 - What changes to the outcomes have been observed to date across stakeholders?
 - To what extent can these changes be linked to the GDA programme?
 - What internal/external factors supported or inhibited the progress toward the outcomes?
 - What lessons can the programme integrate to enhance outcome achievement?
- » **Usage and direct alignment:** IFIs 1) increase their use of EOIDs within their work practices, 2) promote the use of EOIDs more broadly, and 3) support CS stakeholders in their usage.
 - What changes to the outcomes have been observed to date across stakeholders?
 - To what extent can these changes be linked to the GDA programme?
 - What internal/external factors supported or inhibited the progress toward the outcomes?
 - What lessons can the programme integrate to enhance outcome achievement?
- » **Mainstreaming:** EOIDs are planned and provisioned for in the financial resources and operations of all relevant programme phases of IFI development assistance projects.
 - What changes to the outcomes have been observed to date, across stakeholders?
 - To what extent can these changes be linked to the GDA programme?
 - What internal/external factors supported or inhibited the progress toward the outcomes?
 - What lessons can the programme integrate to enhance outcome achievement?
- » **Longer-term impact:**
 - What changes to this long-term impact have been observed to date, across stakeholders?
 - To what extent can these changes be linked to the GDA programme?

The mixed methods evaluation used document review, semi-structured interviews, a survey, and information collected during the GDA industry engagement event on 15 December 2023.

- » **Document reviews.** GDA AID consortia create deliverables within the scope of their contracts with ESA. These deliverables were analysed according to key themes emerging from the evaluation questions. These documents include the GDA AID Thematic Sector Final Report and aggregated results of the GDA AID Task 4 User Feedback questionnaire. Additionally, Caribou



Space conducts quarterly reviews with each GDA AID consortium to review data provided by consortia on their measurement of specific metrics (e.g., the status of EOIDs).

- » **Semi-structured interviews (key informant interviews).** Key informant interviews (KIIs) have been conducted to complement ongoing programme monitoring with WB, ADB, ESA, and the GDA consortia representatives. All interviews were held over Zoom in September, October, and November 2023. A total of 38 individuals were invited for interviews, and 30 interviews were held. Of the 30 completed interviews, 8 were with GDA consortium leads, 8 with ESA staff, 3 with ADB project contacts, and 11 with WB project contacts. The same data analysis framework (based on the key evaluation questions) was applied to the coding and analysis of these interviews.
- » **Survey.** In October 2023, a survey was conducted with all members of the GDA AID consortia to gather insights on critical aspects of the GDA programme, such as mainstreaming, impact, process, opportunities, and future plans.
- » **GDA industry engagement event.** On 15 December 2023, ESA held an event at ESRIN in Frascati, Italy, that brought together more than 40 European organisations involved in GDA. This event allowed the evaluation team to acquire diverse insights from industry leaders and ESA representatives regarding effective engagement strategies with IFIs, enhancing awareness and value proposition, and strategic planning for the post-GDA period.

Phase 3: Analysis

The analysis phase identified the key themes from the data collected against the programme-level TOC and evaluation questions. All data was coded in Dovetail and analysed against the coding framework.

Annex three: GDA EO Companies' Procurement Achievements

TABLE 2: Overview of GDA EO Companies' Contract Achievements

Company	Service description	Funding organisation	Country
Atlantic International Research Centre (AIR Centre)	Earth Observation Pilot collaboration	Maldives Space Research Organisation	Maldives
Gisat and ZAMG	Early warning system design	ADB	Nepal
Gisat	Mapping green spaces	WB	Democratic Republic of Congo
GMV	Flood risk analytics and capacity building	WB	South Sudan
GMV	Deforestation risk assessment tool testing	IFC	Colombia
GMV	Enhancement of cloud-based EO satellite processing environment and capacity building	ADB	Indonesia
GMV	Support for integrated management of Miombo forest and resilient food production	WB	Mozambique
Luxembourg Institute of Science and Technology and CIMA Research Foundation	Flood recovery support	ADB	Pakistan
Planetek Italia	Provision of an EO-based platform for sectoral information services	ADB	Indonesia
Sistema	Coastal erosion monitoring and migration assessment using satellite data	ADB	Fiji, Afghanistan, Tajikistan, Uzbekistan



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