Global Development Assistance

Evaluation Year 3

December 2024

GDA powered by esa in partnership with ADB

Caribou

www.caribou.global

Digital transformation creates opportunities for a more inclusive and sustainable world. We equip ambitious governments, companies, and foundations, with the strategies, insights, and tools to mobilise and shape technology to achieve their impact goals.

Caribou Climate Resilience & Sustainability – supports our clients, to harness Earth Observation and other digital technologies for climate resilience and sustainable development.

Acknowledgements

This report was written by Giulia Costella, Chiara Pasquini, and David Taverner.

Caribou would like to acknowledge the following people for their valuable contributions to this report:

The Caribou team for their respective support on evaluation design, execution, coordination, and editorial feedback: Nicki McGoh, Charlotte Fafet, Carlotta Maucher, and Elise Montano.

The ESA team for their support of this project and their time and insights: Christoph Aubrecht, Alex Chunet, Clement Albergel, Michela Corvino, Marc Paganini, Philippe Bally, Tania Casal, Mariangela Castaldo.

The numerous GDA programme stakeholders from the World Bank, Asian Development Bank, and the GDA Consortia who gave their time and insights during interviews.

Recommended Citation

Caribou for ESA. Global Development Assistance Evaluation Year 3. Farnham, Surrey, UK: Caribou, 2024

Contents

Glossary

ABC	Advancing and Building EO Knowledge and Capacity
ADB	Asian Development Bank
AID	Agile EO Information Development
APP	Analytics and Processing Platform
CCC	Communicate-Connect-Cooperate
CS	Client State
DEP	Digital Earth Partnership
EARSC	European Association of Remote Sensing Companies
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EO	Earth Observation
EO4SD	Earth Observation for Sustainable Development
EOID	EO Information development
ESA	European Space Agency
FFF	Fast EO co-Financing Facility
GDA	Global Development Assistance
KII	Key Informant Interview
IFAD	International Fund for Agricultural Development
IFI	International Financial Institution
M&E	Monitoring and Evaluation
NDA	National Development Agency
R&D	Research and Development
Space for IDA	Space for International Development Assistance
TA	Technical Assistance
TO	Technical Officer
TOC	Theory of Change
TOR	Terms of Reference
WB	World Bank
WO	World Order

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 evaluation is the third yearly evaluation conducted by GDA M&E and builds on the Status Review of Year 1 and the Midterm Evaluation. It is completed by Caribou 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 December 2024. It assesses the GDA programme's status and progress against the impact pathways in the programme Theory of Change (TOC).

How has the implementation of GDA Agile Information Developments progressed?

Agile EO Information Development (AID) activities remain the core driver of GDA's success. By December 2024, GDA consortia delivered 174 distinct EO Information Developments (EOIDs), supporting 85 IFI projects across 69 unique countries. Of these, 90 EOIDs have been completed and handed over for use, while 77 EOIDs are in development, and 7 EOIDs remain in the discussion phase. This expansion demonstrates both the programme's growing scale and its iterative approach to meeting IFI and CS needs.

Improved engagement has strengthened IFI ownership of GDA activities. Joint project selection processes, involving IFI teams at an early stage through consultations and questionnaires, ensure that EOIDs are aligned with IFI priorities and genuine demand. This has led to more effective results and increased sustainability, particularly in partnerships with the World Bank (WB) and Asian Development Bank (ADB).

Strong collaboration has been key to the successful delivery of quality EOIDs. Consortia have been efficient and responsive, delivering high quality EOIDs that meet IFI specifications and project needs. IFI project managers play a critical role in facilitating collaboration and acting as intermediaries between consortia and CSs. ESA secondees at IFIs have also been instrumental in identifying projects, driving engagement, and facilitating collaboration. Their ability to navigate operational processes and act as technical liaisons has been widely praised, with stakeholders suggesting additional support to deepen their impact.

The technical capacity of IFI teams remains a challenge. Projects benefit significantly when technical specialists are involved early to articulate needs and assess EO products, whereas limited expertise can slow progress and require greater guidance from GDA consortia. Flexibility and adaptive workflows are essential, as the resource-intensive initial phases of EO development often require substantial input from IFI teams.

How has the implementation of GDA's cross-cutting activities progressed?

GDA Fast EO co-Financing Facility (FFF) is a rapid response model for EO development. Launched in October 2023, GDA FFF uses a rapid response system to co-develop EOIDs with IFIs through pre-committed, aligned activities. By simplifying engagement and focusing on pre-operational service development, the facility aims to reduce time to impact while supporting broader, longer-term project outcomes. As of December 2024, 16 projects are at various stages of completion, with two work orders delivered, 6 in progress and 6 under review for user requests. Early challenges in activation workflows have been addressed, allowing for smoother progress and more streamlined project rollouts.

GDA FFF's engagement approaches increase accessibility and collaboration. The adoption of a personalised engagement process for non-EO experts has made GDA FFF more accessible compared to the standard questionnaires used in GDA AID activities. Direct discussions between consortia members and IFIs have clarified needs and solutions, promoting inclusivity and responsiveness. However, coordinating technical discussions among consortia members and ensuring that expertise fits within the FFF framework remains a challenge and requires structured approaches to maintain efficiency.

GDA Analytical and Processing Platform (APP) offers a cross-cutting analytical environment. This activity started in September 2023, with the APP public launch planned for early 2025. APP aims to create a flexible platform that provides streamlined access to EO data for IFI and CS workflows. The iterative development process, informed by user consultations with eight WB teams and one IDB team, refined the prototype. By May 2024, the platform's 11 analytical building blocks were operational, allowing users to test and provide targeted feedback for further improvements. Hands-on user engagement proved essential, as early discussions revealed that IFI leads struggled to articulate needs without tangible demonstrations. Iterative feedback loops have improved the APP's ability to respond to diverse needs, although clear communication of free and paid-for service offerings remains critical to managing user expectations.

GDA Advancing and Building EO Knowledge and Capacity (ABC) will serve as a central repository of EO-related resources. ABC started in June 2023, with the online Knowledge Hub to be launched in early 2025. The ABC activity focuses on creating resources for knowledge sharing and capacity building. The platform, which includes a library, training tools, and consultation areas, has faced challenges with taxonomy consensus and engagement with GDA AID consortia. Despite these setbacks, progress continues and user testing is underway to refine the Knowledge Hub's functionality.

GDA Communicate-Connect-Cooperate (CCC) amplifies the GDA programme's impact. Since May 2023, CCC has focused on developing high-quality communication materials to enhance the programme's visibility and storytelling. Efforts to increase engagement through the GDA website and social media channels, particularly LinkedIn, have shown promising results. However, audience reach in emerging markets remains limited, and the need for iterations on content led to delays in content integration.

GDA Monitoring and Evaluation (M&E) supports strategic decision-making. Active since January 2022, the GDA M&E team has provided strategic insight and measurement systems to track programme impact. While producing numerous reports, webinars, and strategy documents, the team has faced data collection challenges due to limited proximity to programme activities and varied responses from consortia. Improved mechanisms for reviewing findings and ensuring timely adaptation of recommendations are needed to optimise strategic responses.

GDA Modular Learning Content (MLC) was launched in November 2024 without significant progress by December 2024. It is a dedicated knowledge-sharing and advocacy activity featuring interviews with IFI senior management, project implementation staff, and in-country stakeholders, with a focus on the demand side.

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 CS using an EOID created by a GDA thematic area; for example, a CS uses an EOID for ongoing monitoring, or an IFI uses an 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.

Around three-quarters of completed EOIDs, for which data has been obtained, were used as intended. The majority (42%) were used for analysis and reporting, reflecting IFIs' reliance on data-driven decision-making. A further 16% raised awareness of EO capabilities, while 15% found operational applications such as flood monitoring. However, 28% were not used, suggesting room for improvement in ensuring relevance and applicability.

Variations in EOID usage highlight the importance of thematic and user-centred approaches. The use of EOIDs varies significantly between thematic areas due to different technical and contextual needs. Themes such as Urban Sustainability require localised engagement and collaboration, while more general areas such as Water Resources offer more transferable solutions. Tailored engagement strategies that address local complexities and user needs improve usability and adoption. User-friendly approaches, such as simplified animations to explain an EOID, have been particularly effective in supporting non-expert audiences.

Timeliness and clear communication are critical to EOID usage. Introducing EOIDs too late into an IFI project life cycle leads to limited flexibility for integration, whilst early introduction can lead to inefficiencies when IFI project requirements are still evolving. Managing IFI expectations around EOID development timelines and scope is essential to ensure smooth adoption.

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 GDA EOIDs have improved decision-making for IFIs by providing precise and granular spatial data, enabling detailed analysis. This level of accuracy has been particularly valuable in sectors that require complex data modelling, especially in areas with limited prior research. The integration of supplementary datasets and maps has further strengthened project planning, providing critical insights in data-poor regions such as small islands and developing countries.

Several factors have contributed to the success of EOIDs. Working with CSs has built long-term capacity, enabling them to integrate EO tools into their workflows and driving structural changes such as the creation of GIS-focused roles. Strong partnerships between IFIs and CSs, supported

by established data sources and methodologies, have enabled the integration of EO products into institutional workflows, fostering new initiatives and ensuring sustainable impact.

However, challenges remain. Limited access to the underlying source code of EOIDs limits the ability of IFIs and CSs to adapt or scale these solutions, hindering long-term usability. Even where EOIDs are open source, the required high up-front investments—in training, resources, and maintenance—can deter adoption. In addition, EOIDs that lack widely accepted standards face scepticism in institutional decision-making, while capability gaps and insufficient alignment between CS needs and EO solutions further limit their impact.

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.

GDA has catalysed the targeting of IFI resources to support EO technologies. Regarding IFI's "direct alignment" to GDA consortia themselves (see definition below), a survey of GDA consortia found that 42% reported no follow-on opportunities, while 23% were in advanced discussions and 13% had signed new contracts, showing mixed results. Successful examples include scaling up geospatial solutions for agricultural resilience in East Africa and post-conflict impact assessments. GDA FFF projects alone have attracted up to €840,000 in commitments, with individual projects receiving up to €250,000 in matching funds.

Agriculture, Fragility, and Water Resources have emerged as key focus areas, with combined alignment funding of over US$7.5 million. Urban Development and Climate Resilience have also received significant support, reflecting the value of EO tools in adaptive infrastructure and governance. In addition, IFIs are funding capacity-building programmes, such as ADB's US$800,000 technical assistance for EO workshops in Indonesia and WB missions in Congo and Liberia.

Several barriers limit the alignment of resources. EOIDs are sometimes perceived as "one-off" products or optional tools, which reduces IFI buy-in. Bureaucratic processes within IFIs delay adoption, while limited access to EOID source codes hinders scalability and customisation. High up-front costs for capacity building and variability in geospatial expertise among CSs further complicate sustainable use. Frequent government staff turnover adds another layer of difficulty, requiring repeated engagement to re-establish project value.

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

The use of EO technologies by IFIs has steadily increased. EO-related projects at the WB (according to Project Appraisal Documents) comprised less than 4% of all projects between 1997 and 2014 before starting to rise over the last 10 years. A peak of 14% in 2021[1] may highlight the wider use of satellite data during and after the COVID-19 crisis, when field data collection was made difficult or impossible due to travel restrictions. Financial commitments tracked by the OECD Creditor Reporting System show a sharp increase since 2017, reflecting growing interest in EO solutions. European EO companies report steady commitment, although funding from WB and ADB declined slightly in 2024, while IFAD emerged as a new source.

Major IFI-led initiatives are using EO for resilience planning, climate risk assessment, and geospatial integration. Examples are the WB's Space2Stats and IFAD's GeoTech4Tenure and Capitalising on Earth Observation Data to support Project Design, Implementation and Evaluation (CAPEO) project. These efforts highlight the growing reliance on EO technologies to address climate challenges, promote sustainable development, and drive innovation in project design and implementation.

New partnerships are accelerating EO mainstreaming, including ESA's collaboration with the European Bank for Reconstruction and Development (EBRD) to support climate-focused monitoring and evaluation. These initiatives align EO technologies with IFI goals, such as EBRD's target of allocating 50% of its funding to climate-related projects, and promote scalable, sustainable solutions to global development challenges.

Definitions

- **EOID**: An EO Information Development/Case Study is real-world implementation of EO products (or services) produced by a consortium or organisation to address an IFI team's needs, often, but not always in a specific country with a CS. They are developed using EO imagery and/or data with value-adding algorithms: for example, "Coastal Hazard Hot Spot Identification in Nigeria," "Flood Historical Records in Indonesia." An EOID/Case Study is implemented, exists in reality, and can be counted; it is not a hypothetical capability.
- **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. This is typically committed towards the end of the GDA AID activity or afterwards. However, within FFF and potentially later thematic areas (e.g., Forest and Climate Adaptation and Finance), this commitment can occur at the start of the engagement (often termed "co-financing").
- **Indirect alignment:** Broader IFI-driven initiatives to promote the adoption of EO technologies beyond those originating from GDA.

1 This data was obtained using a text mining pipeline analysing the frequency of EO-related strings in WB project documents. Keywords used for this purpose were "satellite," "remote sensing," "Earth Observation," "geospatial," "imagery," and "EO4SD." Note that "GIS" was excluded as it returned too many unrelated projects (which may, in turn, result in false positives). Moreover, one current limitation with the set keywords is around "satellites," which also returns projects related to satellite communication rather than satellite EO (therefore creating false positives). Despite these measures, this use of keywords may not exclude false positives and false negatives.

Summary and recommendations

The GDA programme has made significant progress in mainstreaming EO technologies into IFI operations. Through its EOIDs, GDA has demonstrated the value of EO tools in improving decision-making, planning, and operational efficiency. These EOIDs have provided granular insights across multiple sectors, enabling IFIs and CSs to address complex challenges such as climate risk assessment, water resource management, and agricultural resilience. Examples of transformative impacts include better data-driven project designs, refined policy development, and the integration of EO tools into ongoing national workflows. Notably, EO-enabled projects have led to structural changes in some CSs, such as the establishment of GIS-focused roles and improved geospatial capacity.

The programme's ability to foster innovation has been demonstrated by initiatives that extend the use of EO beyond the demonstration phase, with some IFI projects adjusting their approaches and scaling up EO-based solutions for wider applications. In addition, the GDA has catalysed partnerships between IFIs, CSs, and EO service providers, creating momentum for cross-institutional collaboration and co-investment. This progress reflects growing awareness and institutional interest in EO technologies and their potential to address sustainable development goals and climate challenges.

Despite these achievements, there are still barriers to the full mainstreaming of EO technologies. Challenges include limited scalability of EOIDs due to proprietary constraints, misalignment of some EO solutions with specific IFI and CS needs, and variability in the technical capacity of CSs to integrate EO into their systems. High up-front resource requirements, such as investment in training and capacity building, have also slowed the adoption process in some cases. In addition, bureaucratic complexity within IFIs and frequent leadership changes in CSs have hindered the momentum needed for long-term adoption.

The holistic impact of EO is evident in its ability to bridge the gap between technical innovation and practical application in development contexts. While EO adoption within IFIs is growing, achieving full mainstreaming will require addressing these persistent challenges and improving the adaptability and usability of EO solutions in diverse institutional and geographic contexts. In its current form, the GDA programme has laid a strong foundation for transforming development practice through EO integration and has positioned itself as a key player in advancing the use of geospatial technologies for sustainable development.

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

- **ABC should continue to aim for a consensus on the taxonomy of EO Capabilities**, used on the Knowledge Hub. These should be mapped, by ABC and M&E, against each consortium's EOIDs to show aggregate demand across thematic areas for the underlying "Lego brick" EO Capabilities. GDA AID consortia can express the broad applicability, to address development challenges, of their underlying EO Capabilities, to IFI and CS teams.

- **CCC should continue to focus on—and to track progress towards—reaching a range of stakeholder groups with its communications outputs**, going beyond the EO sector and current IFI partners to a wider IFI and CS audience, including in emerging markets. This will help to raise awareness of EO and of the programme itself among target groups, supporting the achievement of the overall programme objectives.

Demand-side testing and co-design

- **During the user engagement process, IFI secondees and GDA AID consortia could try to gain an understanding of the level of capacity,** both within IFI teams and their CS counterparts. While this might not be used directly to screen for eligibility and inclusion in the programme, it would help consortia partners to better tailor their interactions and the likely level of support that will be required throughout the engagement process.
- **APP requires clear communication and expectations management regarding pricing** with IFI and CSs, as it has introduced a freemium pricing model, which is novel in GDA.
- **GDA should continue to find ways to align projects with IFI priorities to strengthen co-ownership and to increase the likelihood of securing aligned financing.** It has been useful to involve experts in an advisory role in critical phases of the EOID development process to advise less technical teams on more technical aspects and to ensure that requirements are met.
- **GDA staff could draft a high-level explanation of the anticipated "scope boundaries" of EOIDs** offered under the GDA programme. This could include guidance and restrictions on aspects like geographical scale covered, the level of technological value-add and innovation that will be offered, and delivery timeframes. This guidance could be reinforced by GDA AID consortia during the user engagement phase to ensure that expectations are aligned from the outset.
- **The FFF should set internal targets about work-order processing speeds and stress test them** with different work orders that they receive. There should also be a formalised procedure for engagement of consortium partners during the initial stages of engagement with the IFI partners before any partner is awarded the RFP.

Capacity building to support usage and mainstreaming

- **ABC should set clear expectations with GDA AID consortia** regarding contributing resources and time to the ABC Knowledge Hub, including having team members available via the planned consultation rooms.
- An articulation of the delineation of responsibilities for capacity building between ABC, and the GDA AID consortia and IFIs, would help clarify the "division of labour" in terms of capacity building.

Usage and mainstreaming

- **The GDA team should continue to diversify its IFI partners to facilitate usage and mainstreaming** across the development finance sector. In the context of its inclusion into the Earth Action approach, GDA should aim to include more partners and will need to find a lighter-touch operating model that works between ESA and those partners that may not have a dedicated ESA-assigned focal contact point through whom activities are coordinated.

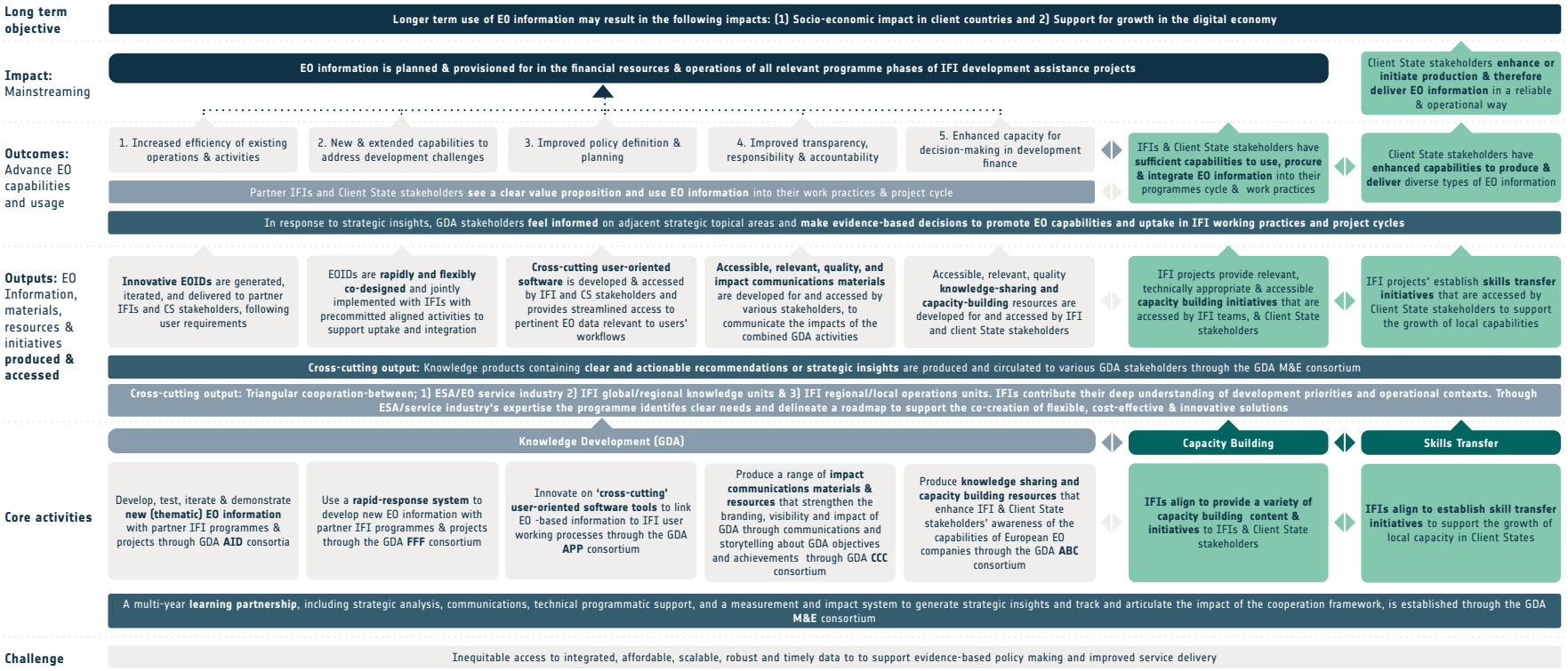
- **GDA should work with industry partners to explore innovative business and pricing models** that will enable them to realise the strategic value and profitability of GDA activities, while delivering products and services that are valued by and used by their end users beyond the initial project timeframe.
- **APP would benefit from communicating to GDA AID consortia if consortia's outputs are considered for future hosting inside APP.** This would ensure that consortia have clear expectations and can plan for potential integration with APP, particularly for GDA AID activities that have closed.
- **GDA M&E will establish a calendar of key topics and data collection requirements for the Quarterly Impact Insights.** These quarterly sessions will allow GDA to receive timely feedback to course correct the programme and facilitate the ESA secondees to support data collection from the IFIs.
- **GDA M&E will share "Impact-Orientated Learnings" for other ESA programmes,** to spread best practices from GDA as an impact-focused initiative, via training materials and sessions.

Report structure

Theory of Change

This evaluation—led by Caribou—assesses the GDA programme's status and progress against the impact pathways in the TOC, as visualised in Figure 1. A video-based version of the TOC, developed in 2022, is also available here. The report structure is based on the TOC.

FIGURE 1: GDA Theory of Change



Report section navigation

1. **How has the implementation of GDA AIDs progressed?:** GDA AID implementation, focusing on progress, delivery quality, and factors influencing the observed results.
2. **How has the implementation of GDA's cross-cutting activities progressed?:** Cross-cutting GDA activities implementation, focusing on progress, delivery quality, and factors influencing the observed results.
3. **Did the IFIs and CSs use the GDA EOIDs?:** Usage rates of EOIDs developed by the GDA AID consortia.
4. **Were there impacts for IFIs and CSs when using the GDA EOIDs?:** Identification of the early impacts experienced by IFIs and CSs 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 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. **Summary and recommendations:** Reflections on the aggregate progress of the GDA programme against the TOC, alongside recommendations.

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 one of the most life-changing events of this era.[2] 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)[3]: 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 bring 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

This evaluation is the third yearly evaluation conducted by GDA M&E and builds on the Status Review of Year 1 and the Midterm Evaluation. The evaluation was conducted in three phases: 1) inception, 2) data collection, and 3) analysis. During the inception phase, the evaluation team reviewed the TOC and assumptions to update the critical evaluation questions and tools. Data collection focused on specific questions related to the implementation status, effects and impacts of the programme and relative mechanisms. The mixed-methods evaluation used document review, semi-structured interviews, and surveys. The analysis identified key themes from the data collected against the TOC and evaluation questions (see Annex two).

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

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

How has the implementation of GDA Agile Information Developments progressed?

Summary

As of December 2024, 3 GDA AID activities have been completed and 8 are in progress. The monitoring records show that, as of 18 December 2024, GDA AID has 77 EOIDs under development and 7 EOIDs at the discussion stage; 90 have been handed over to IFI projects for use.

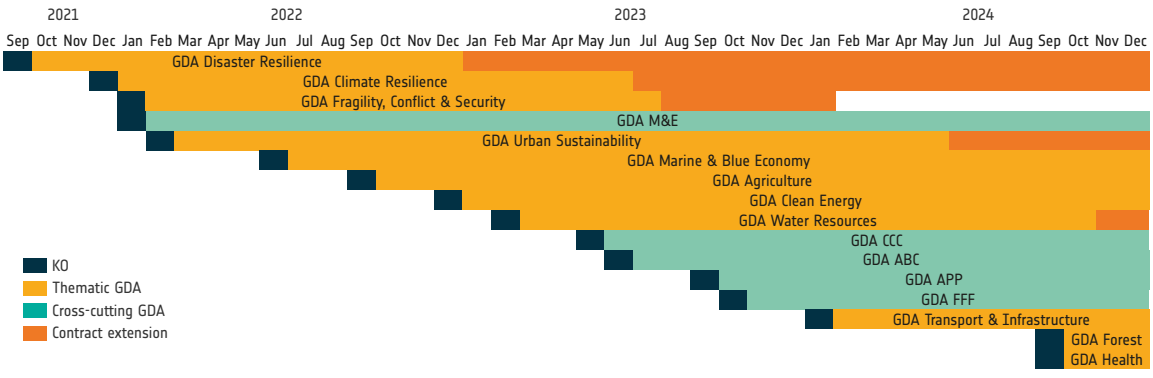
GDA AID implementation status

- A strategic shift in the process of engaging IFIs in project selection has strengthened IFI ownership.
- Consortia efficiently address IFI needs, align EOIDs with specifications, and deliver punctually.
- Proactive IFI project leads are essential for effective collaboration during GDA activity rollouts.
- Reliance on IFIs for communication with CSs limits direct communication, causing miscommunication and unmet expectations, and weakening cooperation.
- The level of IFI teams' geospatial knowledge can affect the EOID development process.
- There is demand for flexibility and adaptive styles of working to successfully support EOID development and use.
- Projects directly involving CSs require additional flexibility.
- The role of the ESA secondee at IFIs is deemed crucial in driving the process forward.

GDA programme 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 December 2024, the programme encompasses 11 GDA AID activities (three of which have been completed, the remaining are still ongoing) and six cross-cutting initiatives (all in progress). The following sections analyse the rollout of activities and assess the processes for GDA AID and GDA cross-cutting activities.

FIGURE 2: Timeline of GDA Activities



GDA AID activities implementation status

GDA defines an EOID as "*real-world implementation of EO products (or services) produced by a consortium or organisation to address an IFI team's needs, often but not always, in a specific country with a CS. They are developed using EO imagery and/or data with value-adding algorithms: e.g. 'Coastal Hazard Hot Spot Identification in Nigeria,' 'Flood Historical Records in Indonesia.' An EOID/ Case Study is implemented, exists in reality and can be counted—it is not a hypothetical capability.*"

GDA AID activities develop EOIDs across 11 thematic areas following three sequential six-month agile cycles. Through the iterative creation process, innovative EOIDs are generated, iterated, and delivered to IFI and CS stakeholders, following user requirements. Since April 2024, two new GDA AID consortia have commenced (GDA Forest Management and GDA Public Health) and three GDA AID consortia concluded their activities (GDA Climate Resilience; GDA Marine and Blue Economy; GDA Fragility, Conflict and Security).

The GDA programme incorporates mechanisms for adaptability: Contract Change Notices (CCNs). ESA grants CCNs in various circumstances, including if there is a need for 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. Since April 2024, two new CCNs have been issued for GDA Urban Sustainability and GDA Water Resources. Two consortia, GDA Disaster Resilience and GDA Climate Resilience, have been operating under a previous CCN. By December 2024, monitoring records showed 174 distinct EOIDs serving 85 IFI projects in 69 unique countries. GDA AID has 77 EOIDs in development and 7 EOIDs at the discussion stage; 90 have been handed over to IFI projects for use.

A strategic shift in the process of engaging IFIs in project selection has strengthened IFI ownership.

In the previous process for ensuring IFI ownership of GDA activities, GDA sourced demand from the IFIs before starting an engagement and selected IFI projects following consultations with the respective IFI teams. This IFI engagement process has strengthened during 2024. For instance, with the WB, GDA now starts by gathering requirements through a questionnaire to assess alignment, involving both the respective WB project teams and the global practices directly. Sometimes, a WB consultant helps identify and prioritise opportunities, fostering a more collaborative process and enhancing IFI ownership compared to earlier practices.

Similarly, with the ADB, project selection is now a shared process focused on IFI priorities and projects with high potential for follow-on activities.

> *"ADB's criterion has been: let's take fewer use cases, but let's take the ones that are routed to be something [i.e., a loan]."*
>
> **Paolo Manuta, ESA focal point at the ADB, KII 2024**

Involving CSs early often leads to additional capacity building, funded by the IFIs, and reusable products for other countries. Overall, GDA consortia observe that genuine IFI demand results in more effective collaboration.

> *"It was really an open and interactive communication with the IFI team; they have a real demand on geospatial information in the project, which is not always the case."*
>
> **Jonas Franke, GDA Clean Energy consortium member, KII 2024**

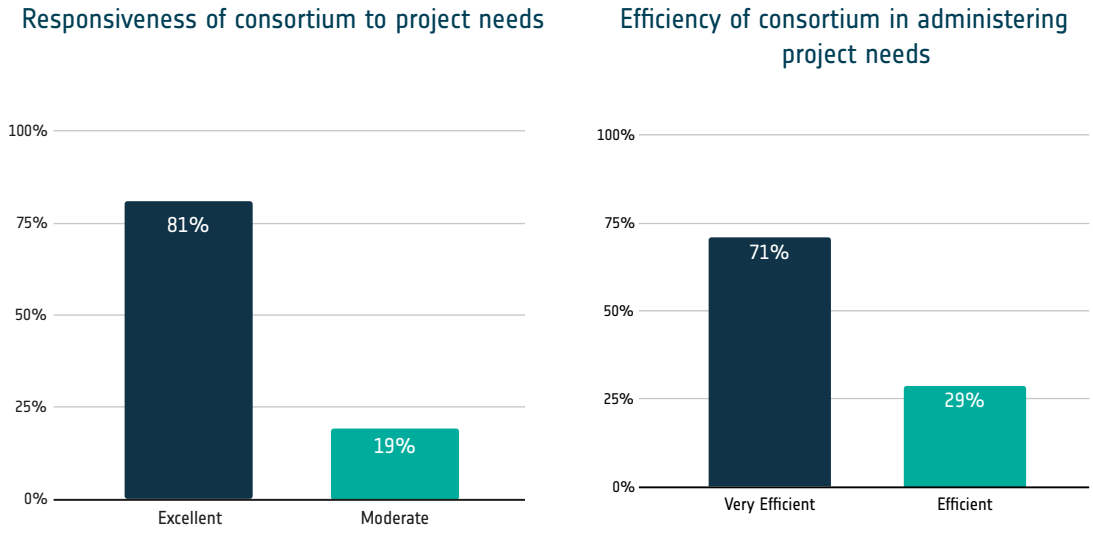
Conversely, when initial interest from the IFI team "tails off," the IFI teams assume a more passive role, which doesn't translate into sustained engagement from that team.

> *"But because it wasn't the main goal of our programme, we really didn't invest a lot of resources or time into it. So a little bit of what would have helped out my team would have been to have someone who proposed a standard approach or a reasonable first approach to do this."*
>
> **Peter Baum, WB project lead, KII 2024**

Consortia efficiently address IFI needs, align EOIDs with specifications, and deliver punctually.

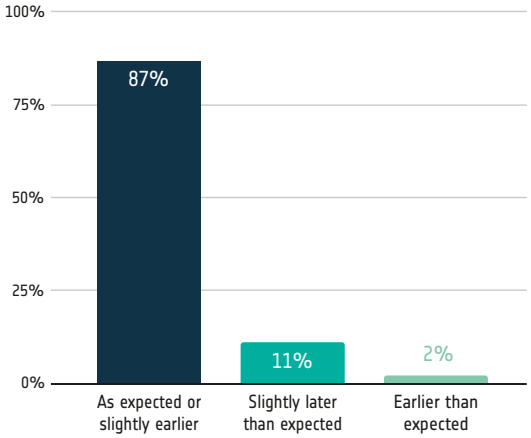
The efficacy of consortia in addressing project needs is corroborated by GDA AID Task 4 User Feedback questionnaire results, which were gathered from IFI project leads.[4] IFI collective feedback indicates that the consortia respond efficiently to project requirements, manage project needs, and deliver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

FIGURE 3: Evaluation of Consortium Performance by IFIs

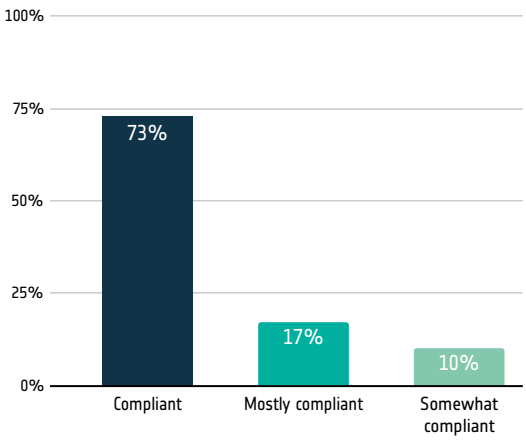


4 Findings are based on responses from 35 IFI project leads, four more than the results showed in the Midterm Evaluation

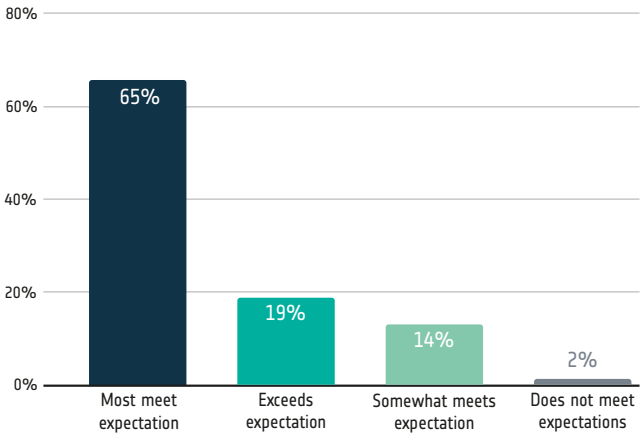
Timely delivery of the EOIDs



Compliancy of the EOIDs with IFI specifications



Accuracy of delivered EOIDs



Proactive IFI project leads are essential for effective collaboration during GDA activity rollouts.

GDA AID consortia mainly interact with IFI project leads, who act as intermediaries, ensuring the flow of information between GDA AID consortia and CSs. This mediation is a key aspect of the engagement, aimed at facilitating interactions and "*limit transaction costs*" (Babar Naseem Kham, WB project lead, KII 2024).

In fact, direct communication with local authorities is sometimes limited for various reasons, often due to political and cultural factors. For example, in Armenia, the national data required for EOID implementation was provided through the IFI, because the national authorities prefer to interact with counterparts with greater local knowledge.

IFI project leads are critical in facilitating smooth collaboration during GDA activity rollouts. GDA consortia report that proactive IFI project leads are often identifiable early on, with their level of engagement reflecting the EO product's importance within the IFI project and that project lead's workload. However, frequent turnover of IFI project leads can delay EO development.

> *"If IFI teams are not pushing from their side to move forward, then it probably won't be a fruitful project. I have never seen a case in which the TTL is not very active at the start and then suddenly works to make progress on the activity and find funds to align."*
>
> **Carlos Domenech, GDA Climate consortium lead, KII 2024**

Reliance on IFIs for communication with CSs limits direct communication, causing miscommunication and unmet expectations, and weakening cooperation.

Dependence on indirect communication with CSs through IFIs can sometimes limit direct interactions, resulting in miscommunication and difficulties understanding the specific needs of local stakeholders. In some cases, for example, promises made by IFIs to provide data were not fulfilled, and without direct communication with CSs, consortia were left unsure of why these delays occurred or why expectations were not met. The absence of direct contact also made it difficult to ensure that CSs were fully prepared for meetings or familiar with the methods used. Without these direct links, the gap between expectations and results widens, reducing the effectiveness of cooperation.

> *"It's difficult getting working connections with the local clients there because there are always a lot of promises, for example, that we will get some data, but [CSs] communicate with WB people, and we don't know exactly how these discussions go and what went wrong. And sometimes all the promises doesn't materialise, and we don't know why."*
>
> **Tomáš Soukup, GDA Urban consortium member, KII 2024**

The level of IFI teams' geospatial knowledge can affect the EOID development process.

Limited technical knowledge within IFI teams can pose challenges during EO development, particularly in articulating needs and assessing products. Teams with geospatial expertise navigate the process more effectively, while those with less experience often depend on GDA consortium guidance. The initial engagement phase is especially difficult for teams unfamiliar with EO technology. One project leader, who self-identified as lacking technical knowledge, noted the potential value of input from a technical expert within their IFI. In another instance, a project lead successfully involved a technical specialist in the process.

> *"The main issue that you find when you're with IFIs is that their background is not exactly in geospatial data. So you might have some difficulties at the beginning to make them understand the advantage of using satellite data and to advance with respect to what they are doing."*
>
> **Stefano Natali, GDA Climate Resilience consortium member, KII 2024**

> *"From the WB, they made available a couple of technical people with whom we were able to communicate and through which we were able to (modify) the tool and to make it more usable. It was an effort on both sides. On our side, we were trying to communicate better what was needed and what we have to do. And on the other side, it was also a step toward us to better understand our work."*
>
> **Stefano Natali, GDA Climate Resilience consortium member, KII 2024**

In some cases, an IFI project lead expressed interest in a specific initiative, only for subsequent technical personnel to find it less promising. This disconnect can lead to efforts being expended on services that are ultimately discarded, resulting in process inefficiencies.

There is demand for flexibility and adaptive styles of working to successfully support EOID development and use.

As is common in innovation projects, service providers must be prepared to address unforeseen challenges and adapt their workflows accordingly. GDA companies reported that they enter contracts without knowing what they will develop, as this is only defined when they engage with IFIs. This is perceived as a deviation from their usual operating method, which challenges their ability to plan for resources. In addition, the initial development phase of the EOID is reported to be particularly resource intensive, requiring substantial involvement from the IFI team and a considerable learning curve regarding EO capabilities. Subsequent iterations primarily involved IFI teams providing reactive feedback. The heavy reliance on IFI input and the variability in their required efforts extended timelines, this was reported to have disrupted the consortia's work plans.

> *"At times, we faced challenges in receiving prompt responses to our requests from some IFIs' teams, as key personnel were often on missions or faced constraints in responding promptly. These delays had cascading effects, including difficulties in defining areas of interest, retrieving institutional data, and establishing contacts with local experts, which ultimately impacted development cycles."*
>
> **Antonello Aiello, GDA Marine consortium lead, KII 2024**

One IFI project lead suggested that a checklist outlining essential and desirable technical data requirements for successful activities would be beneficial. This would allow IFI teams to ensure activities are viable from the outset and to take prompt action in gathering the input.

Projects directly involving CSs require additional flexibility.

An IFI project lead described challenges aligning timelines between the GDA consortium and the CS. Although the IFI project was initially deemed suitable for GDA services, the CS's delayed commitment meant that by the time the IFI project lead re-engaged with GDA, GDA funding had already been reallocated to a different EOID. Ultimately, GDA could only provide a subset of the services initially discussed, which disappointed the CS and posed reputational risks.

Additionally, language barriers (consortia members not speaking the language spoken in the project country, and CS representatives not speaking English) often require IFIs to mediate through translation. This slows discussions and introduces communication challenges, particularly when non-technical intermediaries need help to convey technical concepts and data requirements from the CS to GDA (e.g., when the GDA consortia need data from CSs).

The role of the ESA secondee at the IFIs is deemed crucial in driving the process forward.

Both IFI teams and GDA consortia members have highlighted that the role of the ESA secondee at the IFIs was crucial in identifying projects, facilitating collaboration, addressing administrative issues, and, at times, as technical support on the IFI side. Both IFI and GDA stakeholders suggested that it

might be beneficial if the secondee had a small team to deepen involvement and facilitate interactions between IFI and GDA consortia.

> *"So we have been supported by the secondee every time we needed something. He was very responsive."*
>
> **Juan Suárez Beltrán, GDA Agriculture consortium lead, KII 2024**

> *"The secondees really opened the doors for us, which was nice. So we were presented as the experts on our topics and the IFI teams would be in good hands with us."*
>
> **Eva Haas, GDA Water consortium lead, KII 2024**

> *"The ESA secondee at the WB was helpful because he knew the system. It's not the technical things that we were mostly stuck with. It was the organisation around that. And I think that already it was great to have someone who knew the WB."*
>
> **WB project lead, KII 2024**

How has the implementation of GDA's cross-cutting activities progressed?

Summary

Six cross-cutting GDAs are in progress. In particular, GDA FFF has 6 EOIDs in progress, 2 completed, and 8 at discussion stage. GDA CCC has been producing and disseminating communication materials that reach the public, mainly through the GDA website and LinkedIn. GDA ABC has advanced with the development of the Knowledge Hub, due to launch in Q2 2025. GDA M&E carries on monitoring activities through different tools and mechanisms and produced knowledge products which, once discussed, can help make the GDA programme more effective.

GDA Fast Co-Financing Facility implementation status

- GDA FFF is gaining momentum, with 16 projects under discussion, in progress, or completed.
- Initial delays in activation processes, which is the phase of engagement with the IFI, highlighted the need for streamlined workflows.
- A personalised engagement approach enhanced the accessibility of GDA FFF for non-EO experts.

GDA Analytics and Processing Platform implementation status

- Addressing IFIs' needs required an iterative development process.
- Clear communication of the scope of services and pricing model is crucial to managing user expectations.
- The APP is now advanced enough to start the engagement of GDA AID consortia to incorporate their work.

GDA Advancing and Building EO Knowledge and Capacity implementation status

- GDA ABC's Knowledge Hub development is advanced, but more user testing is needed.
- Taxonomy definition faces consensus and adoption challenges.
- Engagement challenges with GDA AID consortia slowed progress.

GDA Communicate-Connect-Cooperate implementation status

- Productive collaboration support GDA CCC progress, despite challenges with technical integration and approval process.
- GDA website and LinkedIn see strong engagement, while audience reach remains limited on other channels.

GDA Monitoring and Evaluation implementation status

- GDA M&E has established channels to monitor activities but faces challenges in collecting comprehensive data due to lack of proximity to programme activities and low response to data requests.

- Since its launch, GDA M&E has produced public- and private-domain knowledge products, to support learning and decision-making, however mechanisms for reviewing findings need to be implemented to optimise response to recommendations.

GDA Modular Learning Content (MLC) status

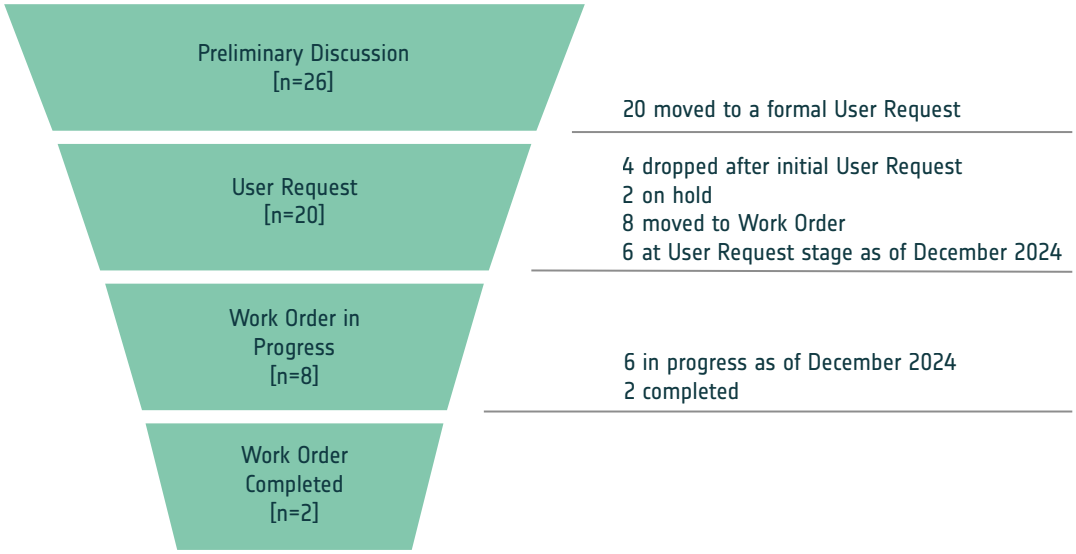
- It was launched in November 2024 without significant progress by December 2024.

GDA Fast EO co-Financing Facility implementation status

GDA FFF, launched in October 2023, uses a rapid-response system to develop new EOIDs with partner IFI programmes and projects. Through the GDA FFF consortium, EOIDs are rapidly and flexibly co-designed and jointly implemented with IFIs with pre-committed aligned activities to support uptake and integration. GDA FFF builds on lessons learned from EO4SD's EO Clinic, and from the implementation of GDA AID thematic areas, and aims to reduce the time to on the ground application by simplifying engagement procedures and focusing on short-term pre-operational development of services. Additionally, through the conditionality of alignment of complementary activities, it aims to support a broader and longer-term impact of GDA FFF projects.

GDA FFF is gaining momentum, with 16 projects under discussion, in progress, or completed.

FIGURE 4: Status of GDA FFF Projects as of December 2024



GDA FFF starts engagements with preliminary discussions with the IFI; these can result in a User Request from the IFI or be dropped. Some engagement can be put on hold for a period until the right conditions, like IFI alignment or timing, materialise. The next step is the RFP publication, which results in the identification of GDA companies that will work on the project and a Work Order (WO). As of December 2024, 2 WOs have been completed, 6 WOs are currently in progress, and 6 user requests are being processed. Additionally, 2 projects are on hold following IFI user's request, 6 projects have halted after preliminary discussions, and 4 projects have been dropped after the IFI User Request. The most common reasons for a project being dropped include unrealistic timelines for product delivery and

technical infeasibility. Political issues at the CS level also contribute to project cancellations.

Initial delays in activation processes, which is the phase of engagement with the IFI, highlighted the need for streamlined workflows.

More time than initially planned was needed to streamline the various FFF engagements, leading to some delays; indeed for the first work orders, it took approximately four months to go from an expression of interest from an IFI to the issue of an RFP and two more months before the WO kickoff meeting. However, things are beginning to progress more smoothly. The initial engagement process proved to be very time-consuming for the consortium's prime contractor, as they are the only company actively involved from the consortium at this stage. Selecting which consortium members will participate in each project occurs after the RFP is issued; however, significant work is needed to define the project's needs and requirements before the RFP can be issued

> *"We needed a bit of time to figure out exactly how to streamline GDA FFF engagements. Therefore, the first few months of the activity have been rather slow in terms of implementation, but we are now reaching the cruise speed, allowing us to speed up processes and the support to be provided."*
>
> **Alex Chunet, ESA secondee at the WB, KII 2024**

A personalised engagement approach enhanced the accessibility of GDA FFF for non-EO experts.

For GDA AID activities, IFI project leads express interest through the IFI Requirements questionnaire. However, the GDA FFF process adopted a more personalised approach. Non-experts often find questionnaires challenging due to limited information. In contrast, GDA FFF started with the IFI secondee engagement and followed up with direct conversations with the consortium lead to clarify needs and solutions. This approach made EO capabilities clearer for non-experts, and GDA FFF more approachable and responsive than the standard process.

> *"The more personalised approach in the engagement phase is more inclusive, especially for non-experts in the EO sector. And that's the exact goal, to spread knowledge of EO capabilities."*
>
> **Alexander Kreisel, GDA FFF consortium lead, KII 2024**

The FFF consortium lead was not always the most suitable participant for technical discussions, necessitating the involvement of other consortium members, prior to the formal WO commencing, to discuss some technical aspects. This collaborative approach has been effective and without conflicts thus far: IFI projects have been allocated to GDA companies with relevant expertise, occasionally involving shared responsibilities. However, there is no guarantee that all interested GDA companies in the FFF consortium will always be engaged. In some cases, FFF consortium members might provide input during the initial phase, only for the FFF consortium to determine that their involvement is not essential for the team assigned to the WO. As a result, the current approach may present challenges in the future, potentially necessitating a more structured process.

GDA Analytics and Processing Platform implementation status

The GDA APP activity was started in September 2023, with the APP public launch planned for early 2025. APP consists of designing and implementing a flexible and versatile analytical environment within GDA. Most core activities occurred in 2024. These included:

1. A consultation process with stakeholders to gather needs and requirements from the platform's intended users.
2. The development of the platform.
3. A user validation workshop on the platform prototype.

Through the GDA APP consortium, cross-cutting user-oriented software is being developed for IFI and CS stakeholders. The platform will provide streamlined access to pertinent EO data, relevant to users' core workflows.

Addressing IFI's needs required an iterative development process.

The first step in the GDA APP plan was to gather user requirements through consultations with eight WB teams and one IDB team. Early discussions showed that IFI project leads needed help to express their needs due to limited technical knowledge and trouble envisioning the APP's potential. Whilst the initial intention with APP was to not develop services from scratch but rather build on solutions and customise them to IFI stakeholder needs, the APP team found it challenging to initially demonstrate the value of the potential services.

> *"It was very difficult to demonstrate our value and the value of the services we wanted to offer. So it was perhaps a vicious circle. We needed to understand what they wanted, but they needed to see something tangible to understand what we are trying to develop."*
>
> **Simone Mantovani, GDA APP consortium lead, KII 2024**

To address this, the consortium started development to create a prototype enabling iterative improvements based on user feedback.

> *"While the initial process can only produce a limited understanding of the internal workings and true information needs, the continuous engagement (accompanied by iteratively improving APP versions for testing and evaluation) will delve deep into stakeholder needs to uncover underlying challenges and opportunities that will continuously inform the development of generic solutions for a wide audience."*
>
> **GDA APP, User and System Requirements Report**

By May 2024, the 11 analytical building blocks—the basic units of the platform—initially planned were functional, and users were reconvened to provide feedback on the prototype. Key suggestions included adding summary statistics with the map, defining indicator measurement methodology, and setting visualisation preferences.

> *"Users [IFI project leads] can access the platform and test the EO capabilities by inputting various parameters themselves. This hands-on experience helps them better understand the geospatial services*

> *and provide more precise feedback about their needs."*
>
> **Hanna Koloszyc, GDA APP consortium member, KII 2024**

GDA APP suggested that, given that user engagement is resource-intensive, GDA AID consortia, with frequent interactions with IFI teams, could eventually streamline the process by identifying and transmitting requirements, including technical considerations, directly to APP, reducing the need for future rounds of engagement.

Clear communication of the scope of services and pricing model is crucial to managing user expectations.

The APP aims to balance accessibility with sustainability by offering free capabilities with a limited scope while retaining paid services for more extensive or specialised analyses, similar to the formats provided by GDA AID and GDA FFF. User engagement interactions, where potential users expressed positive surprise upon learning that some services would be offered for free, underscored the importance of managing user expectations early in the rollout process.

By providing a user-friendly and accessible platform, the APP can effectively demonstrate its capabilities to a broad audience, serving as an entry point for engagement. However, for more complex or high-demand use cases, users will need to engage with the GDA AID and GDA FFF consortia. One proposed solution involves offering free services within clearly defined limits, such as restricted geographic areas (e.g., to a certain amount of square meters) or specific types of analysis (e.g., that requiring advanced calculations), while ensuring that users understand the boundaries of these offerings.

Clear communication will be crucial to the success of this model, particularly regarding the transition between free and paid services. Users must be informed of any changes to the platform's scope or terms, especially after the GDA programme concludes, to prevent dissatisfaction or confusion. Transparent messaging about these limitations and the necessity of further discussions for expanded services will help maintain trust and set realistic expectations among users.

The APP platform is now advanced enough to start the engagement of GDA AID consortia to incorporate their work.

The development of the APP is progressing in the right direction, as confirmed in the acceptance review meeting held in October 2024. The review also identified specific areas requiring improvement to be addressed. As a result of its current progress, the APP platform has now reached a stage where the GDA APP consortium can begin engaging with GDA AID consortia. This engagement will aim to facilitate the sharing of EOIDs, which can then be integrated into the APP platform for reuse, enhancing collaboration and resource efficiency across consortia engaged in EOID creation. Despite this progress, a potential challenge lies in addressing the reluctance of some GDA companies to share their EOIDs, which could limit the scope of contributions and reduce the APP's overall impact. Overcoming this resistance will be critical to ensuring the success and broader utility of the APP platform.

GDA Advancing and Building EO Knowledge and Capacity implementation status

The GDA ABC started in June 2023, with the online Knowledge Hub to be launched in early 2025. It aims to produce knowledge-sharing and capacity-building resources with the objective of enhancing IFI and CS stakeholders' awareness of the capabilities of European EO companies. GDA ABC's main product will be a Knowledge Hub consisting of an interactive online environment optimised for knowledge exchange, expected to be developed by 2024 and launched in Q2 of 2025. The platform is intended to serve as an interactive repository of EO capabilities in development contexts, along with related information, examples, and resources.

GDA ABC's Knowledge Hub development is advanced, but more user testing is needed.

The Knowledge Hub, consisting of a library, trainer area, and consultation room, was developed on schedule. The library contains resources from other GDA AID consortia and materials that ABC created for this activity. The trainer area offers curated training resources and capacity-building materials, allowing trainers to build customised activities. In the consultation room, users can submit queries, first answered by a chatbot, with the option to consult a human expert if needed. As of December 2024, the platform is hosted on a test server, with full deployment planned after migration to the ESA cloud. The development plan did not include specific targets for user testing; as a result, it was deprioritised and postponed following delays. Although the platform didn't undergo a formal user consultation ahead of its first validation workshop, feedback from ESA, GDA consortia, and IFI project leads was gathered. Content validation and user testing began in Q4 2024, with refinements expected to focus on terminology and labelling.

> *"There is now a functioning platform that still needs to be completed, but it's already in an advanced stage of development."*
>
> **Mariangela Cataldo, GDA ABC TO, KII 2024**

Taxonomy definition faces consensus and adoption challenges.

Defining the taxonomy has been unexpectedly complex and time-consuming, with consensus still pending. GDA ABC launching after other companies and consortia had already been using certain terms for a while, made it difficult to establish terminology that satisfied all parties and even harder to ensure consistent adoption. A key challenge lies in developing a taxonomy that not only reconciles the differing priorities and technical nuances of industry stakeholders, but is also easily understood by IFIs. Striking this balance between industry alignment and accessibility for IFIs has been particularly complex, underscoring the importance of early collaboration and inclusive design in future initiatives.

Engagement challenges with GDA AID consortia slowed progress.

The low responsiveness of GDA AID consortia has hindered development progress. Despite repeated outreach—through direct contact, meetings, and ESA requests—responses remained inconsistent. This may be due to consortia receiving numerous, seemingly duplicative requests from various cross-cutting GDAs without being informed early on about their expected involvement. ESA has since refined its messaging to highlight the benefits of collaboration, but the impact is still unclear. Additionally,

repeated interactions were needed to clarify the specific input required from consortia.

> *"The engagement phase proved more challenging than expected, partly due to heterogeneous responsiveness, partly to differences in interpreting requests. Despite formalised definitions - coordinated with other cross-cutting activities - and efforts to ensure clarity in ABC's communications, each company and consortium interpreted questions and requests in a slightly different way. This necessitated additional interactions, further extending the overall time required for this type of work."*
>
> **Mariangela Cataldo, GDA ABC TO, KII 2024**

GDA Communicate-Connect-Cooperate implementation status

GDA CCC launched in May 2023 and has since been working to create impact communications materials to enhance the GDA programme's branding, visibility, and storytelling around its objectives and progress. The consortium aims to develop accessible, high-quality resources for stakeholders to communicate the impacts of GDA activities effectively. GDA CCC produces a quarterly press news room hosted on the GDA website along with other communication and storytelling materials shared on GDA channels.

Productive collaboration supports GDA CCC progress despite challenges with technical integration and approval processes.

Through the involvement of secondees, GDA CCC has built strong relationships with other consortia and IFI teams. After clarifying roles and competencies, effective communication channels were established. Notably, GDA CCC has had positive, regular coordination with other cross-cutting GDA activities, like GDA ABC and GDA M&E, to ensure programme communication consistency.

> *"There is a close coordination with the different core activities and the teams. And this is something that is contributing very well to our communication efforts and how we manage to promote the impact of the programme."*
>
> **Asaf Covo, GDA CCC consortium lead, KII 2024**

To streamline content creation for GDA AID activities, GDA CCC developed templates for consortia to use. However, they faced issues with the optical resolution of submitted materials. In response, GDA CCC issued content collection guidelines and provided targeted support. The main challenge identified is the need for iterations on content leading to delays in technical approvals which have occasionally hampered content integration.

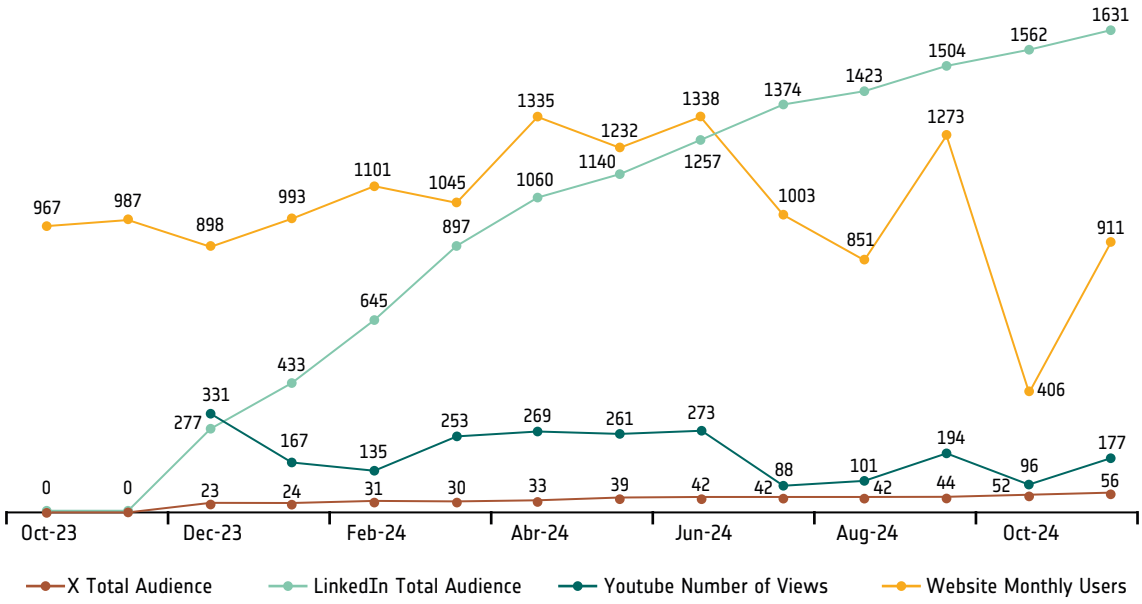
The GDA website and LinkedIn see strong engagement, while audience reach remains limited on other channels.

Since its launch in April 2023, GDA CCC has focused on boosting the GDA website's traffic and building a social media presence on LinkedIn, X, and YouTube. By October 2023, the website attracted nearly 1,000 users per month, with peaks over 1,300 in April and June 2024. Users spend an average of over two minutes on the site, with the most visited sections, after the homepage, being stories and thematic areas.

LinkedIn has proven to be the most effective social media platform, achieving a 5.4% engagement rate in August 2024, with monthly impressions ranging from 4,000 to 14,000. In contrast, X's audience remains small, with a total audience under 50, and less impactful for GDA communications in 2024, while YouTube shows potential, with an average of 208 views per month.

GDA CCC monitors channel performance closely and plans to increase engagement by creating longer content series. They report satisfaction with the mutual traffic flow between the website and social media, which primarily reaches users in Europe and North America but has limited reach in emerging markets.

FIGURE 5: GDA CCC Users by Communication Channel



GDA Monitoring and Evaluation implementation status

GDA M&E has been active since January 2022 as a multi-year learning partnership to provide strategic analysis, communications, technical support, and a measurement and impact system to track and articulate the cooperation framework's impact. The consortium produces knowledge products with clear, actionable recommendations and strategic insights, which are shared with GDA stakeholders.

GDA M&E has established channels to monitor activities but faces challenges in collecting comprehensive data due to lack of proximity to programme activities and low response to data requests.

In line with the GDA Measurement Plan, the GDA M&E team collects data quarterly from GDA AID consortium primes on EOIDs in progress and completed; quarterly from cross-cutting activities ABC, CCC, and APP; and annually from GDA stakeholders on general progress and impact of activities and lessons learned through in-depth interviews. Additional data on mainstreaming is gathered via an industry survey with GDA companies, and a survey with IFIs captures information about IFIs direct and indirect alignment and IFI team satisfaction.

The structure of GDA presents several data collection challenges. GDA companies operate independently, interacting with specific IFI project teams that manage CS relationships, thus adding several interfaces and relationships to the primary data source. The M&E team primarily works with consortium primes, who provide available information but may lack insights into the collaborations with IFI projects led by other consortium members. That is due to logistical constraints and, at times, competition within consortia, which discourages information sharing. Additionally, whilst GDA consortia have terms in their SOWs requiring they allocate time to the provision of relevant data to the GDA M&E consortium, there isn't such a contractual obligation with the IFIs, so GDA M&E has little leverage to ensure data delivery from them.

GDA AID consortia have Task 4: User Feedback, Assessment and Future Planning, within which they collect feedback from IFI teams, to *"follow the agile principle of continuous feedback loops to assess status, gaps, and provide recommendations for improvements."*[5] The consortia conduct this via a combination of unstructured feedback collection via their meetings, emails, and general exchanges with IFI teams, and structured feedback collection via a standardised Task 4 Questionnaire. That has standardised questions to allow consistency and aggregation across thematic areas. The combination of these processes allow consortia to improve their EOIDs via the three six-month agile cycles/iterations. IFI ESA secondees could play a greater role in data collection, particularly focused on collecting information that is invisible to the GDA AID consortia, such as monetary values for Direct and Indirect Alignment (see sections "*Did the IFIs invest their own resources to mainstream the GDA EOIDs?*" and "*Did the IFIs invest their own resources to mainstream EO in general?*") from IFI teams.

Since its launch, GDA M&E has produced public- and private-domain knowledge products, to support learning and decision-making; however, mechanisms for reviewing findings need to be implemented to optimise response to recommendations.

Since its kickoff, GDA M&E has produced three strategy documents, six topical reports (with accompanying webinars), three evaluations, six research documents, and eight webinars. Based on research and stakeholder engagement, these documents offer strategic and practical recommendations from an external perspective. In addition, GDA M&E maintains an Impact Dashboard, which can be accessed through the GDA website, and an IFI Procurement Tracker containing EO procurement opportunities. A series of private-domain products has also been prepared to support ESA decision-making. Although these recommendations have been shared with ESA GDA programme management over the years, there have been few dedicated opportunities to discuss findings and plan any adaptations. A lengthy review process, which for the midterm evaluation lasted about nine months, focused on publication, diverting attention from responding to the recommendations. Going forward, scheduling more frequent sessions to present and discuss GDA M&E's observations could support strategic and adaptive responses at the programme level.

GDA Modular Learning Content

GDA MLC was launched in November 2024 without significant progress by December 2024. It is a dedicated knowledge-sharing and advocacy activity featuring interviews with IFI senior management, project implementation staff, and in-country stakeholders, with a focus on the demand side.

5 GDA AID SOWs

Did the IFIs and CSs use the GDA EOIDs?

Summary

This section examines how EOIDs developed through GDA AID activities have been utilised in their intended use cases within IFI projects. It assesses whether the EOIDs were used as expected and identifies the factors that facilitated or hindered their implementation. Over three-quarters of the EOIDs developed and completed by GDA AID consortia are used by IFIs, of which the majority is used for analytical purposes in reports, decision documents or knowledge products. User-centric design, collaboration between CS, IFI, and the GDA consortium, and the timeliness of the EOID enhance the usability of EOIDs. While EOIDs have demonstrated potential, clearer alignment with IFIs' commitment to adoption is needed for greater success.

Progress on use

- About three-quarters of completed EOIDs were used for their intended purpose.
- The variation in EOID usage among thematic areas reflects differences in technical and contextual needs.

Enablers and barriers to use

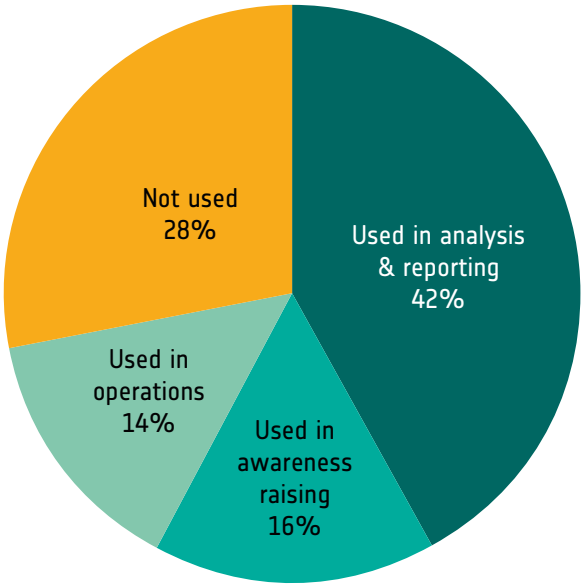
- User-centric design and the collaboration process involving CSs, IFI and GDA consortia enhance usability.
- Effective EOID integration relies on precise IFI project life-cycle timing.
- There is a need to address IFIs expectations about the scale of EOIDs under GDA.
- Timeliness and relevance issues hindered use within IFI projects.
- EOIDs are successful in demonstrating potential, but clearer alignment with IFI commitments to adoption is needed.

Progress on use

About three-quarters of completed EOIDs were used for their intended purpose.

The largest share, 42%, of EOIDs were utilised for analysis and reporting purposes. IFIs adopt a highly analytical approach in their work, relying extensively on data-driven analysis and reports to inform their decision-making processes. Consequently, the use of EOIDs for analytical purposes represents a particularly impactful application. A smaller yet significant portion, 16%, was used for raising awareness about EO capabilities, this was the case for EOIDs that were intended to showcase and introduce IFIs and CSs to new potential applications. Meanwhile, 15% of the EOIDs were employed in operational contexts such as platforms for flood monitoring or periodic maps on water use efficiency. Approximately 28% of EOIDs were not used at all, highlighting a potential area for improvement in ensuring the relevance or applicability of these EOIDs.

FIGURE 6: Breakdown of Use for Completed EOIDs (n=83, data not available for 7 EOIDs)



N=83, DATA not available for 7 EOIDs

While about half of EOIDs developed under the GDA were intended for use by IFIs, the remaining half were designed for exclusive or joint use by CSs. Several examples demonstrate successful use cases where CSs effectively utilised the EO products as intended. In some instances, the product was a platform transferred to CSs for ongoing independent use, ensuring continued application beyond the initial project scope.

> *"And I think that the product we [with GDA AID consortia] developed, and we delivered also helped them [the CS] a lot because they've got a GIS lab now set up. Which we also helped with that particular initiative. So I think this resulted in adequate capacity about how to use these tools."*
>
> **Babar Naseem Khan, WB project lead, KII 2024**

In other cases, the activity focused more on demonstrating capabilities of EO, where the product, such as a video showcasing potential applications, served to illustrate what could be achieved. However, in these instances, the next steps, including whether or how to move forward, will be decided in the future by the CS, with decisions sometimes influenced by political considerations.

> *"We had several videos showcasing colleagues from the bank or stakeholders in the CS talking about how the product has been developed and how it will help them on a day-to-day basis. The video we have on the case of flood monitoring in South Sudan is quite good, and you can see the impact we've made. We have a similar video and similar material for a case in Afghanistan with the Asian Development Bank."*
>
> **Clement Albergel, GDA Climate Resilience TO**

The variation in EOID usage for among thematic areas reflects differences in technical and contextual needs.

FIGURE 7: Number of EOIDs Completed and Used by Thematic Area

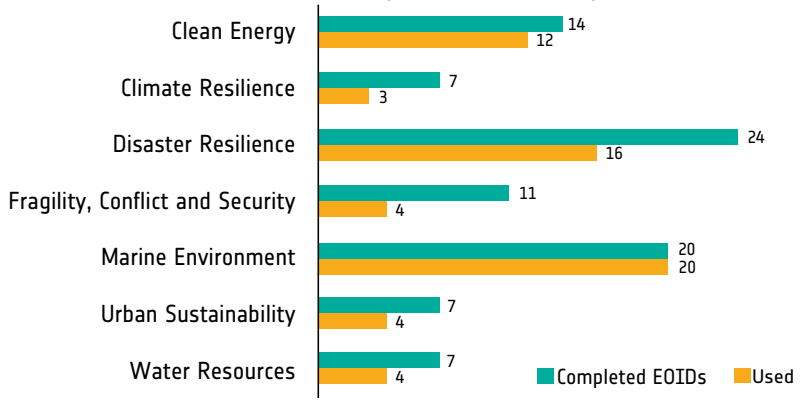


Figure 7 illustrates the number of completed EOIDs across different thematic areas. The significant variations can be explained by two primary factors. First, thematic areas were launched at different times, meaning some still have many EOIDs in progress. Second, thematic areas vary in demand and scope, with some enabling consortia to complete a larger number of smaller EOIDs.

The figure also highlights the number of completed EOIDs that were utilised. Differences in usage rates are partly due to technical challenges that hindered IFI and CS teams from using the EOIDs. However, another key factor is the distinct nature of each thematic area. Some areas, such as Urban Sustainability and Fragility, Conflict, and Security, require extensive contextual knowledge due to their localised focus and emphasis on people. These areas demand greater engagement with local counterparts and benefit from sustained collaboration between EO companies and IFI/CS teams with on-the-ground expertise.

> *"The situation in different cities is quite different. So you need to understand the local situation and that means that you need really to interact with the locals. For some of the products which we see, for example, in GDA Water Resources, or also in Disaster Resilience. I would say that the products are more general and sometimes can be applicable anywhere without much local support."*
>
> **Tomáš Soukup, GDA Urban, KII 2024**

Enablers and barriers to use

User-centric design and the collaboration process involving CSs, IFIs, and GDA consortia enhance usability.

EOIDs designed with end users and their limited technical expertise in mind were particularly well-received, as they facilitated the visualisation of complex topics. Conversely, in some instances, it was observed that EOIDs were delivered in a format that was not as user-friendly, and the GDA company demonstrated a lack of flexibility in adapting it, even in response to requests from IFI users.

> *"I think they [IFIs] were very surprised with the simple animation [to support user-friendliness]. I think it's one of the products that they were more vocal about, saying it had a very good illustrative value."*
>
> **GDA consortium member, KII 2024**

To support EOIDs use within a CS, their buy-in is essential, particularly when the CS has technical experts familiar with EO technology. Involving these stakeholders from the design phase facilitates the integration of the EOID into existing systems and avoids redundancy. Additionally, this approach prevents the perception that the GDA is a top-down initiative. A collaboration process increases the likelihood that the CS will effectively take ownership of the EOID and use it as intended.

> *"For GDA to achieve the biggest possible impact, we need to engage with both the IFI team and CS government, to understand their requirements well, to make them feel motivated and involved in the question. They are the people that are at the end going to use the service."*
>
> **Carlos Domenech, GDA Climate Resilience consortium lead, KII 2024**

See Case Study 1 for a case study exemplifying this.

Effective EOID integration relies on precise IFI project life-cycle timing.

Timing is of critical importance for successfully integrating GDA EOIDs services within IFI projects—which has been noted by all parties involved in GDA AID activities—including GDA AID companies, IFI project leads, and ESA Technical Officers. If GDA activities are introduced when the IFI project is too advanced, there may be insufficient flexibility with that IFI project, to adapt or effectively integrate the EOIDs. Conversely, while engagement between GDA consortium and IFI teams should start as early as possible, the EOID should not be delivered too early, when the identification of the IFIs requirements is still evolving, as this has resulted in excessive back and forth communication and loss of interest.

> *"The timing was correct. It wasn't at the end of the project, and neither was it at the very beginning. So there was still time to incorporate and build on the GDA work."*
>
> **Melissa Brown, WB project lead, KII 2024**

IFIs don't always realise that they need support from GDA in a timely manner and by the time they have engaged with GDA and completed the administrative steps it is too late for the IFI team to integrate the EOID in the project.

In other cases, IFIs are unaware of how much time is needed to complete an EOID, leading to unmet expectations and possibly missed integration of the EOID within the IFI project.

> *"Sometimes the banks are really interested, but it's not the right timing. If when the bank asks us to do a specific activity, we have to start setting up a contract, which can take weeks or even months, we lose their interest."*
>
> **Clement Albergel, GDA Climate Resilience TO, KII 2024**

There is a need to address IFIs expectations about the scale of EOIDs under GDA.

A commonly reported factor hindering EOID usage was their development on a small geographic scale, which contrasts with the broader, national, or regional-level coverage typically required by IFI projects. This feedback, however, highlights the need to better communicate to IFIs that while the GDA consortia can provide larger-scale solutions when integrated into broader initiatives, their

mandate under GDA is not to deliver comprehensive, full-scale operational solutions. Instead, EOIDs are intended to complement IFI efforts by providing targeted and specialised insights, with further applications encouraged through subsequent engagements led and funded by IFIs. See Case study 2 for a case study exemplifying this.

> *"The GDA firm was helping develop a sort of online decision support tool and the work was meant to be plugged into a platform. The final result was actually not incorporated into the platform mainly because of its very small scale."*
>
> **ADB project lead, KII 2024**

Timeliness and relevance issues hindered use within IFI projects.

Although 87% of IFIs stated that EOIDs were delivered within the expected timeline (see Figure 2), some EOIDs that were not delivered within the planned timeline could not be integrated. In other cases, IFIs participated in the GDA activity primarily out of curiosity to explore EO technology, without a strong commitment to its adoption. Lastly, for some IFIs, the development of EOIDs proved to be more resource-intensive than anticipated, leading them to question the value of the investment.

> *"There is a much higher probability for the products we deliver to be used if they are delivered within the exact timeline initially agreed. Otherwise, we expose ourselves to lose the potential relevance of the engagement and its success. Therefore, timeliness is one of the most important determining factors for uptake."*
>
> **Alex Chunet, ESA secondee at the WB, KII 2024**

EOIDs are successful in demonstrating potential, but clearer alignment with IFI commitment to adoption is needed.

There are IFI teams and CSs that have no experience with EO technology, for whom GDA developed EOIDs showcasing and demonstrating capabilities through illustrative videos or prototypes. Recipients reported that such materials were very informative and made them aware of new possibilities.

> *"There are soft training, sort of presentations and materials. You may not call it trainings but those are also useful, beneficial for everyone, including myself."*
>
> **ADB project lead, KII 2024**

It is, however, critical to communicate clearly that the GDA aims to demonstrate these products and bring them to a pre-operational level, with the expectation that IFI teams advance them toward full-scale implementation. There is a need to identify IFI teams that are not merely curious about EO technology but are genuinely committed to integrating it into their operations. Without this commitment from the IFI, there is a risk of focusing efforts on teams that lack the necessary interest level, limiting the long-term impact of the GDA's work.

Case Study 1

GDA Clean Energy: Collaborative design drives usability in energy infrastructure vulnerability assessment for Bangladesh[6]

Bangladesh is one of the most climate-vulnerable countries globally, facing frequent flooding, cyclones, and droughts. Ranked seventh on the Global Climate Risk Index for the past two decades, the country experiences severe challenges that impact its development, including the electrification of rural and urban areas. Recognising these risks, the WB launched the US$500-million Electricity Distribution Modernization Program to enhance the reliability and efficiency of the electricity supply while building resilience against climate and disaster risks.

To support this initiative, the GDA Clean Energy activity collaborated with the WB, the Bangladesh Rural Electrification Board (BREB), and the Power Cell division of the Ministry of Power, Energy and Mineral Resources (MPEMR). It developed tools and analyses tailored to Bangladesh's unique climate risks, focusing on three key hazards:

- **Flood Exposure Analysis:** Leveraging global climate and weather datasets, high-resolution flood models were developed to classify the exposure of energy distribution assets, such as transmission lines and pylons, to seasonal and extreme flooding.
- **Landslide Susceptibility Mapping:** In the Chattogram region, landslide risk analyses integrated geological, land cover, and surface stability data to assess the vulnerability of energy assets.
- **Extreme Wind Modelling:** High-resolution wind models, incorporating Representative Concentration Pathway (RCP) scenarios, estimated the exposure of energy assets to cyclonic winds over 50-year return periods.

FIGURE 8: Extreme Wind Modelling Map for 50 Years Return Level, Considering 3 Scenarios: (left) Representative Concentration Pathway 26 (RCP26), (centre) RCP45, and (right) RCP85

The EOIDs were applied collaboratively with stakeholders, ensuring usability and alignment with their operational priorities. At the national level, flood exposure classifications guided the identification of high-risk regions, where targeted interventions for infrastructure maintenance could be prioritised. Local-scale hydro-

6 GDA, Assessing energy infrastructure vulnerability by estimating climate and disaster risk, 20 August 2024, https://gda.esa.int/story/bangladesh-assessing-energy-infrastructure-vulnerability-by-estimating-climate-and-disaster-risk/

modelling highlighted areas at risk of flash floods, supporting BREB's need for detailed asset-level insights. Similarly, landslide susceptibility analyses in the southeast informed regional planning efforts led by MPEMR.

Workshops and stakeholder discussions were integral to the project, allowing WB teams, ministries, and local stakeholders to contribute their perspectives and refine the tools. This collaborative process ensured the solutions were user-friendly and addressed the specific challenges faced by energy sector stakeholders in Bangladesh.

Moreover, the comprehensive hazard analyses laid the foundation for scaling these solutions to other regions and infrastructure types, demonstrating the replicability and scalability of the approach. Efforts are already underway in Niger and Uganda, showcasing adaptability to varying hazards like flash floods, droughts, and earthquakes.

Case Study 2

GDA Marine Ecosystem: Addressing Expectations on EOID Scope

The WB launched an ecosystem assessment in Tunisia to evaluate blue carbon potential and support marine ecosystem management. The project required data on phytoplankton biomass, seagrass distribution, and water fluctuation patterns for restoration and conservation. Challenges included limited in-situ data for validation and the need for continuous monitoring. The GDA Marine consortium provided EOIDs to meet these needs and support policy and resource management strategies.

The consortium delivered tailored EOIDs for specific areas of interest:

- **Phytoplankton biomass maps:** Insights into ecosystem health and blue carbon.
- **Seagrass mapping (2017–2022):** Tracking changes in seagrass for carbon sequestration analysis.
- **Water fluctuation and salt marsh maps:** Data on water and wetland changes for restoration planning.

The WB initially expected the mapping to cover the whole of Tunisia and Morocco, which was beyond the scope of the project. The GDA Marine consortium clarified its focus on specific areas of interest, such as the Gulf of Gabès, to align with budget and resources.

Key actions to align expectations from the IFI included:

- Highlighting the targeted scope to manage resources effectively.
- Maintain communication to align expectations.
- Demonstrating the utility of the EO product for future scalability across wider geographies.

These efforts shifted the perception of the consortium from a limitless resource to a strategic partner providing targeted solutions.

A key lesson from this engagement is the importance of setting clear expectations from the outset. Defining and communicating the project scope early on helps to align stakeholder understanding and prevent unrealistic demands. Open communication throughout the project is also essential. Regular stakeholder engagement ensures alignment with objectives, addresses challenges in a timely manner, and reinforces the feasibility of deliverables within defined constraints.

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

Summary

This section explores insights into the 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. Some CSs enhanced their data use through the programme. The maturity of the methodology implemented, the availability of the underlying source code of EOIDs for further use by IFIs, and the ability of the CSs to absorb the innovations are some of the key factors contributing to amplified impact.

Impacts

- IFI project leads reported that new EOIDs supported their decision-making.
- Some CSs enhanced their own EO data use through the programme.

Enablers and barriers of impact

- Well-established data sources and mature methodologies in EOIDs are essential in CS and IFI institutional decision-making.
- A reconsideration of possible business models is needed to find a way to enable more affordable longer-term use and impact beyond the GDA project timeframe.
- GDA catalysed new initiatives where collaboration with the CSs was mature and they have sufficient capacity.

The expected impacts of GDA are multifaceted, with significant potential to transform how development challenges are addressed. A central outcome is the increased efficiency of existing operations and activities, enabling stakeholders to achieve greater results with fewer resources. Additionally, the programme is expected to foster new and extended capabilities to tackle complex development challenges. Improved policy definition and planning is another objective, with the programme's outputs enabling better-informed decisions at all levels of development planning. Lastly, the programme is set to improve transparency across all operations. By increasing the accessibility and clarity of information, GDA will facilitate more robust evaluations, support accountability, and enhance trust among stakeholders.

In the GDA Midterm Evaluation,[7] the early impacts of the EOIDs developed by GDA AID consortia for IFIs showed promising results in enhancing operational efficiency, improving policy definition, and supporting better decision-making processes. The integration of EOIDs supported the streamlining of existing operations and facilitated more effective policy planning. Additionally, the information generated through EOIDs has increased transparency, contributing to clearer and more robust evaluations of activities. These initial findings highlight the significant value that EOIDs bring to the IFIs, especially in fostering more informed and strategic decision-making.

7 Caribou Space for ESA, Global Development Assistance Midterm Evaluation, 2024, https://gda.esa.int/wp-content/uploads/2024/09/GDA-mid-term-v4.1.pdf

This section explores how GDA, now at a more advanced stage roughly one year later, contributes towards some of the anticipated impacts and analyses enabling factors and barriers.

Impacts

IFI project leads reported that new EOIDs supported their decision-making.

The impacts of EOIDs have been notable, particularly in enhancing the accuracy and granularity of spatial data used. As an IFI project lead noted, the ability to model spatial data accurately resulted in the production of detailed maps for crops such as sugarcane, citrus, and banana. This precision is crucial, especially given the complexities of modelling certain crops. Such advancements in data visualisation have enabled IFI teams to make more informed decisions, as outlined in Case Study 3.

> *"I think they [GDA AID consortium] were able to model using this spatial data with a lot of accuracy as I understand it, the detailed maps of sugarcane and citrus and banana. Which isn't always easy, because sugarcane is a grass and so it's hard to actually distinguish it from other types of grasses."*
>
> **Melissa Brown, WB project lead, KII 2024**

Additionally, collaborating with GDA has yielded valuable insights that have positively influenced IFI project planning and preparation. One IFI project lead remarked on the beneficial input received from GDA, highlighting how it clarified both possibilities and limitations, which informed subsequent IFI project phases. Integrating supplementary datasets, assessments, and maps has proven advantageous in areas needing more extensive research, such as small, data-poor countries and islands. This comprehensive approach has enhanced the understanding of local contexts and contributed to more effective project outcomes.

> *"We learned a lot from the GDA collaboration. All in all, it was really good input to our project. They gave us very important insight into what is possible and what is not possible, which we took forward in the further project preparation."*
>
> **Hans Enggrob, ADB project lead, KII 2024**

> *"So having these extra data sets and assessments and maps was super helpful. So very helpful. And I think that that's a big value added, in particular in areas that are not heavily studied. For example this small island country that is really poor on data."*
>
> **WB project lead, KII 2024**

> *"The wind atlas is now updated and with calibrated models and wind maps. This project is a first of its kind and is supporting the development of a pipeline for wind projects."*
>
> **Areg Arcady Barseghyan, ADB project lead, KII 2024**

Some CSs enhanced their own EO data use through the programme.

By engaging in GDA activities and providing the required national demographic, environmental, and geospatial data, CSs became more aware of the value of this data that they already possess. Through the collaboration, they also developed the skills to use this data effectively, ensuring that the benefits extend beyond the IFI project's scope, as detailed in Case Study 4.

> *"All the ground-proofing data, all the geo-tagging data comes from the government because it's their teams who are out there implementing these projects. While they collaborated with GDA they also learnt and the element of building capacity of the state actors on how to use this data was achieved."*
>
> **Babar Naseem Khan, WB project lead, KII 2024**

Enablers and barriers of impact

Well-established data sources and mature methodologies in EOIDs are essential in CS and IFI institutional decision-making.

IFIs require established data sources and methodologies to incorporate EOIDs into institutional decisions and operations. In some instances, the EOID represents one of the first applications of a particular technology or approach, necessitating more time and research to convince users of its validity and to support the decision to adopt it. Indeed, there have been instances where the EOID lacked support from an established standard, which affected the ability to use the insights in institutional decisions.

> *"The argument is that it was too risky to use a figure that was not supported by a standard procedure accepted by the community. Statistical offices, they have their procedures, and they provide official figures for the country that can be used just because they come from an established source, even if quality is not ensured."*
>
> **GDA consortium lead, KII 2024**

A reconsideration of possible business models is needed to find a way to enable more affordable longer-term use and impact beyond the GDA project timeframe.

IFI teams have expressed challenges in building upon EOIDs after their engagement with GDA consortia ends. Teams—and their CS counterparts—may be reluctant to be tied into longer-term or even open-ended commitments with industry partners. However, without access to the underlying source code, they are also unable to modify, enhance, or adapt the EOIDs to meet evolving needs or integrate them into ongoing projects. This proprietary limitation not only hinders the long-term usability of EOIDs, but also restricts IFI teams' capacity to fully leverage the technology.

> *"There are quite a few teams at the WB that have requested a service, for example a processing chain that would analyse water quality. However, some of the companies we work with only operate on the basis of proprietary services and have limited interest in open-source approaches. In one specific engagement, the teams on the WB side started progressively withdrawing from the engagement when they realised after some discussions that they wouldn't have access to the code and therefore that it*

> *wouldn't be transferred to the counterpart in order for them to build on it. Therefore, the reluctance of our industry for openness and mismatch in expectations on both sides ended up limiting considerably the possibilities to build strong uptake."*
>
> **Alex Chunet, ESA secondee at the WB, KII 2024**

However, there are concerns with transferring EOIDs and their underlying source codes to IFI or CS users at the end of the GDA AID project, such as capability gaps and unforeseen costs as potential barriers to the ongoing use of the EOID.

> *"It is not because a product or service is open source that it is necessarily going to be free. On the contrary, when you desire to build on an open-source service or for it to be fully transferable to stakeholders, most of the time you will have to align significant resources for capacity building and training which will imply potentially large investments at the beginning and then most probably a certain level of regular maintenance cost to cover for the computing and staff time."*
>
> **Alex Chunet, ESA secondee at the WB, GDA Evaluation Webinar 2024**

Addressing this issue could encourage the EO industry to reconsider its business models, fostering greater collaboration and enabling more sustainable, fit-for-purpose solutions. However, any adjustments must balance the need for transparency with the operational and business constraints faced by the EO sector.

GDA catalysed new initiatives where collaboration with the CSs was mature and they have sufficient capacity.

GDA successfully brought sustained change and supported the development of new initiatives for some EOIDs directed to CSs. These outcomes were typically seen in cases where IFIs had established mature working relationships with their CS counterparts, who had the capacity and resources to engage with the new technology.

> *"When we discussed the lack of local data on slums, as a real reaction, they raised a call for a project, which is currently taking place and is collecting this information. So we stimulated them about what needs to be collected, and it is being collected now in a specific IFI project there."*
>
> **Tomáš Soukup, GDA Urban Sustainability consortium member, KII 2024**

> *"There is a very good impact. For example, in the north coast of Java project, thanks to this capacity we have a collaboration with the Ministry of Public Works and Housing. I will discuss with them to create one project on how to monitor the cost of Java because it is one area very vulnerable to land subsidence."*
>
> **Indonesia CS Representative, KII 2024**

> *"One concrete result of the GDA support is that Ministry of Agriculture chose to adjust one of the new positions they created under the project to hire a GIS Technician. I think originally, that person had a different title and profile, but they decided that they should make this profile a much more focused GIS-focused position."*
>
> **Melissa Brown, WB project lead, KII 2024**

The effects of Capacity Building and Skills Transfer activities with CSs take time to materialise, but in long-standing collaborations, IFI teams are starting to see positive results.

> *"ESA is developing new tools, new algorithms, and new data sets which are highly relevant to us. It's really pushing the agenda of EO mainstreaming, and it helps us to better understand and plan development assistance. Our partners in Indonesia have been very keen in applying those tools for other programs. I'm pleased to see that after years of this partnership [with the CS] we see increased capacity from their side, and they are now doing that type of analysis on their own, and I think that's a great achievement."*
>
> **Eric Quincieu, ADB project lead, KII 2024**

Case Study 3

GDA Water Resources: EO technology empowers decision-making for pollution management in Lake Victoria[8]

Lake Victoria, Africa's largest freshwater lake, is vital to millions of people, providing water for drinking and irrigation, supporting fisheries and maintaining ecosystems. However, pollution, habitat degradation, invasive species and climate variability pose significant threats to the lake and its communities.

In partnership with the World Bank and the Lake Victoria Basin Commission (LVBC), ESA's GDA Water Resources initiative has developed EOIDs to address Lake Victoria's pollution challenges. These services support the Lake-Wide Inclusive Sanitation investment strategy, which focuses on water management and pollution control.

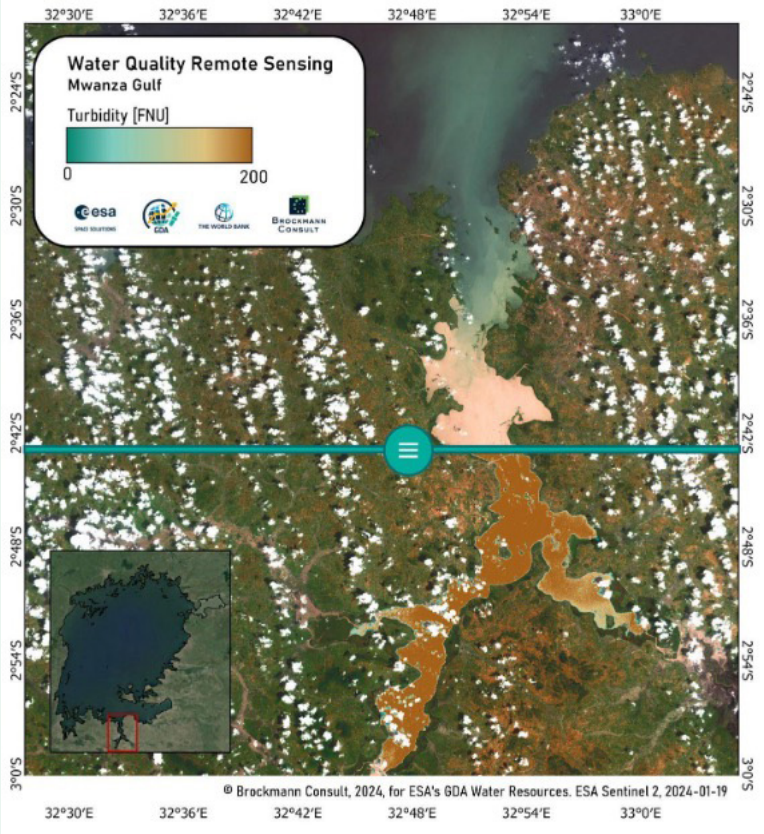
The EOIDs use satellite data to monitor water quality indicators such as:

- **Turbidity:** Tracks sediment concentration.
- **Chlorophyll-a:** Identifies algal blooms.
- **Harmful algal blooms:** Assesses the impact of toxic blooms.

By integrating climatic and anthropogenic data, these tools identify pollution hotspots, assess drivers and guide targeted interventions.

8 GDA, Battling pollution threats of Africa's largest freshwater lake, 8 April 2024, https://gda.esa.int/story/battling-pollution-threats-of-africas-largest-freshwater-lake/

FIGURE 9: EO Turbidity insights on Mwanza Gulf, Lake Victoria



EOIDs were piloted in the Gulf of Mwanza, providing detailed insights into turbidity and chlorophyll-a levels. These results highlighted pollution trends and helped predict future challenges. The data was specifically used to support LVBC's water quality management strategies and ecosystem restoration efforts, ensuring practical applications for sustainable development.

> *"ESA GDA's technical support on monitoring Lake Victoria's water quality through remote sensing complements the support that the World Bank's Water Global Practice has been providing to the LVBC and LVB Partner States in addressing the lake's pollution through Lake-Wide Inclusive Sanitation. Earth Observation and Remote Sensing tools are critical for both decision-making and monitoring of the impact of sanitation interventions."*
>
> **Pascaline Wanjiku Ndungu, WB project lead, feedback to the consortium**

Case Study 4

GDA Marine Environment & Blue Economy: Strengthening Ecuador's ecosystem protection through enhanced data use[9]

Ecuador's mangroves and coastal ecosystems are threatened by human activities such as shrimp farming and agricultural expansion, leading to habitat degradation and pollution. Recognising these challenges, the government of Ecuador has adopted an "Ecological Transition" model to balance economic activities with environmental protection. To support these efforts, GDA Marine developed two EOIDs:

- **Shrimp Pond Inventory:** A comprehensive map of shrimp ponds in Guayaquil Bay to help protect the ecosystem and assess pollution.
- **Mangrove mapping:** Detailed mapping of mangrove cover in Guayaquil Bay and Esmeraldas, supporting conservation efforts.

Ecuador's Ministry of Water, Environment and Environmental Transition used these EOIDs to create an inventory of critical ecosystems by providing detailed and up-to-date maps that provide a comprehensive understanding of their current state. These tools enable the Ministry to monitor changes over time, assess areas at risk of degradation, and prioritise actions to protect biodiversity and ecosystem functionality. In addition, the EOIDs guided ecosystem protection interventions and informed water pollution assessments and sustainable practices. The products enriched the Ministry's data resources and provided accurate information for planning and management.

9 The information comes from GDA Marine D5 Final Report.

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, known as mainstreaming. It examines the direct alignment of IFI resources with the GDA programme, focusing on how co-financing and follow-on commitments enhance the integration of EO technology into development projects. It highlights progress in scaling up EO solutions, Capacity Building, and Skills Transfer, and shows growing interest across different thematic areas, albeit with mixed results. Some 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."*

Direct alignment of IFI resources

- GDA consortia report mixed progress in securing follow-on opportunities from EOIDs, with 42% reporting "no opportunity yet."
- Through current engagements, GDA FFF could attract up to €840,000 in alignment from IFIs.
- 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.
- Half of ADB projects reported alignment or plan to align their geospatial or capacity-building activities with support received from GDA AID activities.
- Aggregated funding prioritises Agriculture, Fragility, and Water thematic areas.
- Capacity building is advancing through IFI-funded training and knowledge-transfer efforts.
- WB project leads show interest in expanding the use of EOIDs.

Enablers and barriers of direct alignment

- Packaging robust analyses as end-user solutions can make EO a sustainable, integral project tool.
- While IFIs' resource alignment cannot always be verified, GDA FFF provides a stronger mechanism for accountability by requiring co-financing.
- The perception of EOIDs as one-off products limits IFI buy-in, while high workloads and decentralised decision-making complicate prioritisation and moderate EO integration.
- Bureaucratic processes in IFIs delay EO adoption by requiring multiple approvals.
- The success of Capacity Building and Skills Transfer activities depends on the ability of the CSs to absorb them.
- Limited CS expertise and shifting government dynamics affect the use of EO technologies.

What does mainstreaming mean?

GDA 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 observed, either via direct or indirect alignment:

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

Through the GDA programme, progress *towards* mainstreaming, rather than *complete* mainstreaming, is anticipated.

> *"GDA was set up as a mechanism to stimulate and facilitate the acceleration of mainstreaming. Hence, we push for mainstreaming but are conscious that full mainstreaming is not achievable in a short time. It is a process that takes much longer than the programme timeframe."*
>
> **Christoph Aubrecht, GDA programme coordinator, KII 2024**

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. This is typically committed towards the end of the GDA AID activity or afterwards. However, within FFF and potentially later thematic areas, e.g. Forest and Climate Adaptation and Finance, this commitment can occur at the start of the engagement (often termed 'co-financing' or 'aligned financing')."*

Regarding IFIs' "direct alignment" to GDA consortia themselves, GDA consortia report mixed progress in securing follow-on opportunities from EOIDs.

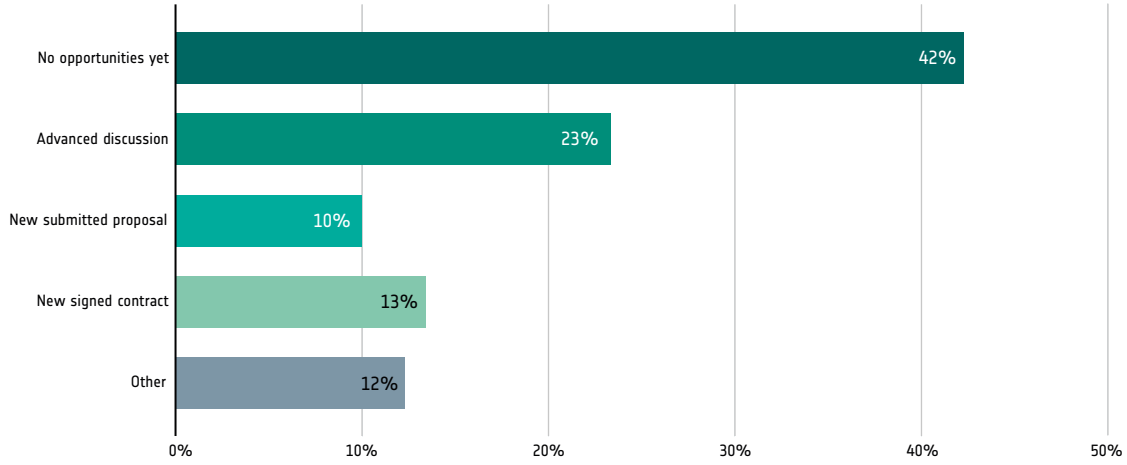
A survey of GDA AID, FFF, and APP consortia revealed that 42% of respondents reported "no opportunities yet" for follow-on funding from the EOIDs supplied, while 23% indicated "advanced discussions," 13% "new contracts signed," 12% "other," and 10% "new proposals submitted."

These opportunities span different thematic areas and show various levels of progress. For example, some IFIs, such as the WB and International Finance Corporation, are exploring expanding services such as climate resilience and clean energy projects. Examples include scaling up geospatial solutions for agricultural resilience in East Africa and exploring applications in post-conflict impact assessments. In particular, the collaboration with GMV Spain and GeoVille demonstrates advanced stages of contract discussions and new procurements under initiatives such as the GDA FFF.

In addition, ongoing dialogues with IFIs such as the European Investment Bank (EIB) and development agencies such as OECD, that emerged from engagements with GDA Fragility, Conflict and Security, reflect a continued commitment to future developments. Also, initiatives such as Rheticus's vertical monitoring services with ADB highlight the concrete results of GDA-related engagements. In contrast, other projects like GISAT's urban sustainability efforts remain in the formative or stalled stages.

The "other" category responses highlight a mix of unrealised opportunities, indirect benefits, and challenges. While some consortia noted that discussions were held—such as exploring funding through the Global Water Trust Fund or extending support activities to new countries—none resulted in concrete outcomes.

FIGURE 10: Percentage of Follow-On Opportunities by Stage for GDA Consortia



Through current engagements, GDA FFF could attract up to €840,000 in alignment from IFIs.

GDA FFF has strengthened GDA's ability to leverage IFI resources for EO-related activities. To date, pledged direct alignment for projects ranges from €30,000 to €250,000 per project. While most projects are still in their initial phases, at least one IFI project has committed €110,000 of direct alignment via procurement from GDA-affiliated companies.

Although not the intention of the GDA programme, it was common for the required product to be developed during the first iteration with subsequent iterations used not to refine the original product—which was typically satisfactory—but to request new services or expanded coverage. Since GDA FFF only allows for a single iteration of product development, any additional work requested by IFIs requires them to allocate further resources to the consortium. This mechanism effectively encourages resource alignment.

> *"In my experience, with GDA AID activities, it was not really the case that a company developed a product which was then refined in the following two iterations. In most cases, the product from the first cycle was the basis for additional developments. So it was less of a product improvement but more consecutive additional work."*
>
> **Alexander Kreisel, GDA FFF consortium lead, KII 2024**

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.

A survey conducted in early 2024 by ESA's Alex Chunet and supported by Digital Earth Partnership's (DEP) short-term consultant Mira Gupta revealed that many WB/GDA AID 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).

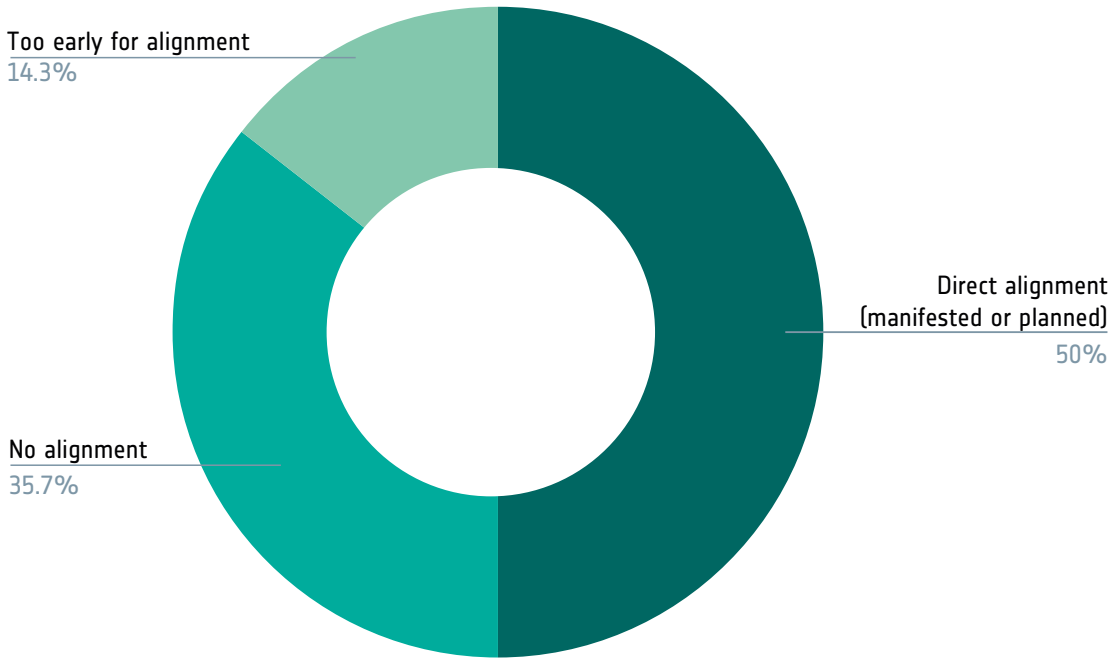
The direct alignment commitments account for about US$10 million, with an average of US$250,000 per project. These projects often benefit from the combined efforts of internal WB resources and external consultants, underscoring the comprehensive and integrated approach employed to enhance the effectiveness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

Half of ADB projects reported alignment or plan to align their geospatial or capacity-building activities with support received from GDA AID activities.

The data on ADB alignment was provided by ESA's focal point at the ADB, Yves Barthélemy, with the support of Paolo Manuta, ADB staff. They found that 50% of ADB projects report actual or planned direct alignment through additional funding for geospatial analytics or capacity-building activities to complement the support provided by the GDA.

Funding commitments for these complementary activities vary widely, with two projects pledging less than US$50,000 and one pledging above $US500,000. In total, the direct alignment accounts for about US$2.9 million, with an average of US$415,000 per project

FIGURE 11: Percentage of ADB Projects by Nature of Direct Alignment

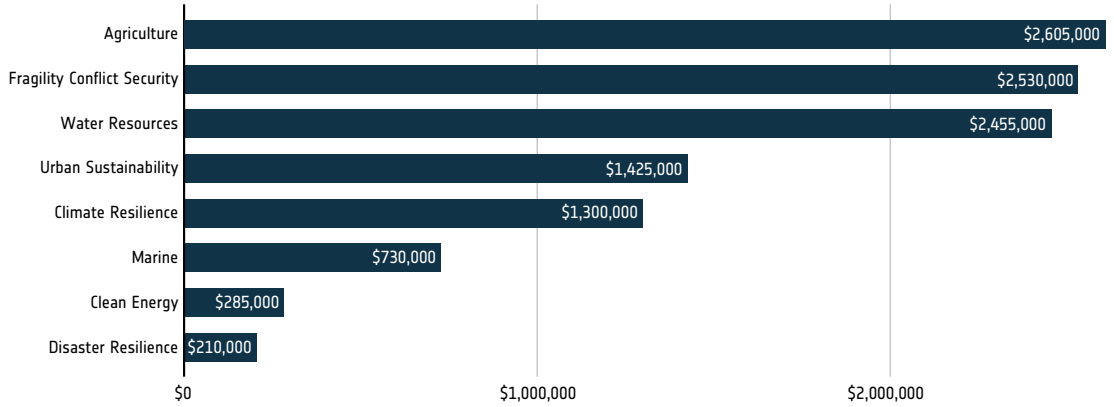


Aggregated funding prioritises Agriculture, Fragility, and Water thematic areas.

The following financial commitments represent aggregated data from WB and ADB across various thematic areas. Agriculture leads with the largest financial commitments, totalling more than US$2.6 million in actual or planned alignment funding. These investments focus on sustainable agricultural systems, recognising the sector's critical role in addressing food security and adaptation to climate challenges. Fragility follows closely with US$2.53 million, focusing on emergency response, infrastructure resilience, and capacity building to support vulnerable communities and stabilise fragile contexts. Water is another important area of investment, with US$2.45 million allocated to improve water resource management and infrastructure, essential for sustainability and resilience to climate impacts.

Urban Development sees a significant commitment of US$1.43 million, aimed at urban resilience and adaptive infrastructure to meet the challenges of rapid urbanisation. Climate Resilience, with US$1.3 million planned or allocated, highlights the growing importance of harnessing disruptive technologies for effective governance of public goods and innovative management of environmental challenges.

FIGURE 12: Aggregated (WB and ADB) Estimated Total Amount of Aligned Resources per GDA Thematic Area



Capacity building is advancing through IFI-funded training and knowledge transfer efforts.

Capacity building is a key element of direct resource alignment, with IFIs funding training and knowledge-transfer activities to support the use of EO technology. In the survey of GDA consortia, 16% and 8% of respondents indicated that they have observed IFI projects, showing an intention to align activities for Capacity Building and Skill Transfer, respectively.

Some promising examples:

- ADB has provided US$800,000 in technical assistance to organise training programmes on flood management and coastal protection using EO technology in Indonesia, driven by GDA Disaster Resilience.
- ADB used the Cloud SEOS platform developed by the GDA Marine consortium for capacity-building and knowledge-sharing activity in Indonesia through a workshop. The workshop was a hybrid presence/remote workshop. Another workshop in Timor-Leste is planned for the second half of January 2025.

- WB committed US$50,000 to support capacity-building missions in Congo and Liberia, using EO to assess country performance in forestry and agricultural sustainability, an EOID provided through the GDA Climate Resilience initiative.

> *"A concrete case now in Congo and Liberia where the bank is putting in money for the same projects... But the absolute majority [of funds] comes from the World Bank...I think it's $50,000 now...that's already committed; we'll have to just make sure the Terms of References (TORs) and everything is in process."*
>
> **WB project lead, KII 2024**

- WB provided Pakistan with in-house training through the World Bank Geo-Enabling Initiative for Monitoring and Supervision as a follow-up activity to the Dashboard for Monitoring Small-Scale Infrastructure works developed through the GDA Fragility activity.

WB project leads show interest in expanding the use of EOIDs.

Several WB project leads have shown an interest in taking EOIDs beyond their initial use cases, although they have yet to commit any resources. For example:

- An EOID on sub-annual land-cover changes initiated in Peru and Bolivia, supported by GDA Climate Resilience, has attracted interest from colleagues working in Africa, leading to discussions on expanding the initiative to Kenya.
- After presenting initial results on methane emissions, a member of the GDA Clean Energy consortium received requests to increase activities in Bangladesh and neighbouring countries.
- In GDA Climate Resilience, the development of a geospatial planning and climate exposure risk application tool for Georgia, Armenia, and Vietnam is attracting interest from other WB project leads. This signals an interest in EO technology for monitoring and analysis.

> *"We had a meeting last week with colleagues inside the WB. The idea is to have also not only an extension of the platform to the countries but also an extension of the tool within the WB because it can be adapted to many different situations. They have to create for different countries' climate risk reports. So the platform can also be used for that purpose."*
>
> **Stefano Natali, GDA Climate Resilience consortium member, KII 2024**

Enablers and barriers of direct alignment

Packaging robust analyses as end-user solutions can make EO technology a sustainable, integral project tool.

To improve the progress towards mainstreaming, IFI project leads emphasise the need for ready-to-use solutions rather than raw data or one-off advice from service providers. This change is especially important considering the limited capacity of CSs, who benefit most from continuous, solution-oriented support tailored to their ongoing projects.

> *"From a user perspective, it would be helpful to have continuity and groups of people specialised in something which can provide user side solutions, not like supplier side data...you can develop very robust analysis, but if those analyses cannot be packaged into like readily available solutions, that would be a challenge"*
>
> **ADB project lead, KII 2024**

While IFIs' resource alignment cannot always be verified, GDA FFF provides a stronger mechanism for accountability by requiring co-financing.

While IFIs are required to pledge aligned resources to GDA AID activities, they have no official obligation to allocate them. The GDA can verify alignment in cases where resources are directed toward additional procurements for GDA companies; however, there is less visibility regarding aligned resources intended for other purposes, such as capacity building with the CSs or hiring consultants who will do further EO work.

> *"In other words, if an IFI says that they start a programme for a certain amount, they need to specify how much of it will be allocated for satellite Earth Observation. This can be a bit difficult to assess."*
>
> **Paolo Manuta, ESA focal point at ADB, KII 2024**

The approach has, however, evolved. With GDA AID activities, resource alignment was largely based on hope or efforts to push for alignment without clear upfront commitments. Under the GDA FFF model, there is a shift toward a more concrete approach, explicitly showcasing alignment before any activities begin. This evolution in the approach to resource alignment marks a significant development in ensuring greater transparency and accountability.

The perception of EOIDs as one-off products limits IFI buy-in, while high workloads and decentralised decision-making complicate prioritisation and moderate EO integration.

The perception of EOIDs provided by GDA consortia as "showcases" or free offerings has led to reduced buy-in from IFIs. This results in a reluctance to commit their resources to EOIDs, viewing them as an optional add-on rather than integral for sustainable development.

> *"Occasionally, the GDA was perceived by some World Bank teams as a readily available resource, which did not always fully acknowledge the significant efforts and resources invested by the GDA through the consortium to address diverse Use Cases and various IFIs' teams. This occasionally resulted in a mismatch between expectations, contributions, and requests."*
>
> **Antonio Aiello, GDA Marine consortium lead, KII 2024**

Moreover, even when project officers are enthusiastic about an EOID, they often need help to prioritise its integration due to the high demands of their roles. With EO as one of many potential tools to support development goals, achieving sustained momentum is challenging.

> *"Since we're working—as the [Asian Development] bank—on several issues, [the engagement with the GDA consortium] is only one of ten things. So when you need something, and it's urgent, it might still be only the fifth item on the list. So progress is very hard to come by. And I say that with all consulting work that happens, it's really important to have a sense of urgency. Otherwise, it's just not a priority."*
>
> **Peter Baum, ADB project lead, KII 2024**

Bureaucratic processes in IFIs delay EO adoption by requiring multiple approvals.

Approval structures within IFIs create an additional layer of difficulty, as EO-based workflows or tools require multiple levels of approval before full implementation. This lengthy decision-making process discourages faster adoption, leading to delays.

> *"Everyone [at the IFI] is doing something, often working independently. People are overwhelmed with information, and a WB project lead explained that getting a workflow product approved by the Bank or integrated into operations requires formal approval. Additionally, for someone to say, 'Oh, this is a great tool; let's use it for our task,' can take an extremely long time—sometimes more than a year."*
>
> **Elke Kraetzschmar, GDA Clean Energy consortium lead, KII 2024**

The success of Capacity Building and Skills Transfer activities depends on the ability of the CSs to absorb them.

CS counterparts exhibit varying levels of geospatial expertise. While some countries and specific government ministries are staffed with dedicated experts, others require more intensive support and demonstrate limited capacity to absorb skills and sustain the use of EO technology. Smaller nations often need more help in both capacity and resources. Additionally, the scheduling of training sessions for government employees poses challenges, as their busy agendas and competing priorities can hinder attendance. Furthermore, CS representatives may prioritise operational tasks over institutional strengthening.

A significant barrier to capacity building is the tendency for government employees with technical expertise to be recruited by the private sector. This trend needs to improve the incentives for investing in capacity development and skills transfer within governmental structures.

> *"Sometimes the people with higher levels of understanding are headhunted by private companies and they don't stay that long in the government. So that's an issue for them because you invest time and money on training them and once they are trained, they come to the private companies."*
>
> **GDA consortium member, KII 2024**

Some GDA consortia reported that they had to build capacity for CSs to understand the delivered products.

> *"But on capacity building and training, basically nothing happens from the World Bank side. So we did a little bit from GDA financing because it was needed. Because when you talk with the clients and they have to understand what you produce, you have to do some kind of small training or small capacity building. But it was really little compared, for example, with EO4SD project, it was really limited because we didn't plan it much."*
>
> **Tomáš Soukup, GDA Urban Sustainability consortium member, KII 2024**

A consortium prime suggested that producing a user-friendly platform has proven effective in improving the CS's understanding and use. They also reported expecting products from the cross-cutting GDAs to complement this.

> *"We have experience that if you present it in an environment, like a web portal or something really easy to operate for people, it has a bigger impact because people can play with the data. They understand it much more than when you provide just a dataset. Unluckily, the cross-cutting GDAs were not operational at the time, some of the products and platforms could have been useful."*
>
> **Tomáš Soukup, GDA Urban Sustainability consortium member, KII 2024**

Limited CSs expertise and shifting government dynamics affect the use of EO technologies.

Integrating EO technology into IFI-supported projects often faces obstacles due to the limited capacity within local institutions to operationalise the technology effectively. This highlights the difficulty of ensuring local adoption and integration of EO data into planning.

> *"We always have funding available to do the due diligence to do these studies...it's more like the (we call it) limited capacity of the local institutions and governments that they can actually utilise this. It's one thing to do a study that answers our questions as ADB saying, "We see the highway that is being built, has these, and these risks". But to also transfer this knowledge and make sure that the government can actually utilise some of the work that is behind that, and ideally integrating in its planning, I think that's really, really difficult."*
>
> **Peter Baum, ADB project lead, KII 2024**

The turnover in key government positions can also compound this challenge. Each change in leadership requires rebuilding relationships and re-establishing the project's value, as new directors need time to understand the objectives and potential benefits.

> *"It is difficult when there are changes in the government, in the sense that you have to start the story telling from scratch with the general manager whom need to understand clearly the value while avoiding overlaps with other bilateral initiatives."*
>
> **Paolo Manuta, ADB project lead, KII 2024**

Case Study 5

GDA Fragility, Conflict and Security: Scaling EO solutions from ADB to EIB in fragility assessments

ADB's Technical Assistance Enhancing Differentiated Approaches in Context-Sensitive Situations aims to institutionalise tailor-made approaches for fragile and conflict-affected situations and beyond, addressing the specific challenges faced by developing member countries in achieving development goals in geographically limited areas. The TA focuses on strengthening decision-making processes through the integration of innovative tools and data-driven methodologies.

In support of ADB's TA, the GDA Fragility Activity used EO and Open-Source Intelligence (OSINT) data to improve Country Performance Assessments. The consortium developed a new aggregate performance indicator aligned with ADB's Country Classification and Performance Ratings. By analysing, pre-processing, normalising, and integrating 105 indicators in 12 countries over 6 years (2017–2022), the consortium provided a comprehensive dataset that captured the economic, social, and political dimensions of fragility. Machine learning techniques, such as k-means clustering, were applied to:

- Identify trends and classify countries based on performance.
- Reveal persistent patterns associated with geographic and contextual factors.
- Highlight strengths and weaknesses for targeted interventions.

Pilot applications in Afghanistan and Cox's Bazar further demonstrated the utility of EO/OSINT data in exploring the links between natural resource crises and fragility, supporting project prioritisation and resource allocation.

The success of the GDA Fragility EOID attracted the interest of other IFIs. As a direct result, EIB awarded e-GEOS, prime contractor, a consultancy contract worth nearly US$50,000. This project aims to implement a proof of concept for country fragility assessment using a multi-source intelligence solution, with a focus on Ethiopia. Notably, the TOR for the assignment explicitly referenced the methodology developed under GDA Fragility.

The EIB initiative demonstrates the replicability and scalability of the GDA Fragility EOID in new contexts. The results from Ethiopia will not only validate the methodology, but also inform the strategies of the EIB's Fragility Regional Development team, with the potential for wider adoption in other regions. This is a critical step in the mainstreaming of EO capabilities within the IFI framework, paving the way for continued innovation in fragility assessments.

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

Summary

This section highlights the growing integration of EO technologies in IFI projects, marked by increased adoption, rising financial commitments, and key initiatives like Space2Stats. It also discusses strategic partnerships, such as ESA's collaboration with the EBRD, which aim to advance EO use in resilience planning, climate assessments, and sustainable development efforts.

EO procurement trends in IFIs

- EO technology adoption grows among IFIs, with increasing projects, financial commitments, and post-COVID satellite use.
- European EO companies report IFI funding, with slight declines from WB and ADB, and IFAD emerging.

Indirect alignment of IFI resources

- Between 2021 and 2024, major EO initiatives enhanced development, resilience, and geospatial data integration in WB and ADB.
- WB is incorporating EO technology through the Space2Stats initiative, integrating geospatial data into its fundamental development strategies.
- ADB's integration of EO is driven by climate goals, sustainable development, and job creation through innovative partnerships and advanced technology use.
- IFAD integrates geospatial technologies to improve land tenure security and climate investments.

Other partnerships

- ESA is in the process of establishing a partnership with the EBRD to improve EO integration.

EO integration trends in IFI funding and documentation

EO technology adoption grows among IFIs, with increasing projects, financial commitments, and post-COVID satellite use.

In recent years, the use of EO technology has been steadily growing among IFIs. This trend reflects an increasing adoption of EO tools for development projects, with notable expansions in EO-related initiatives and financial commitments to EO technologies.

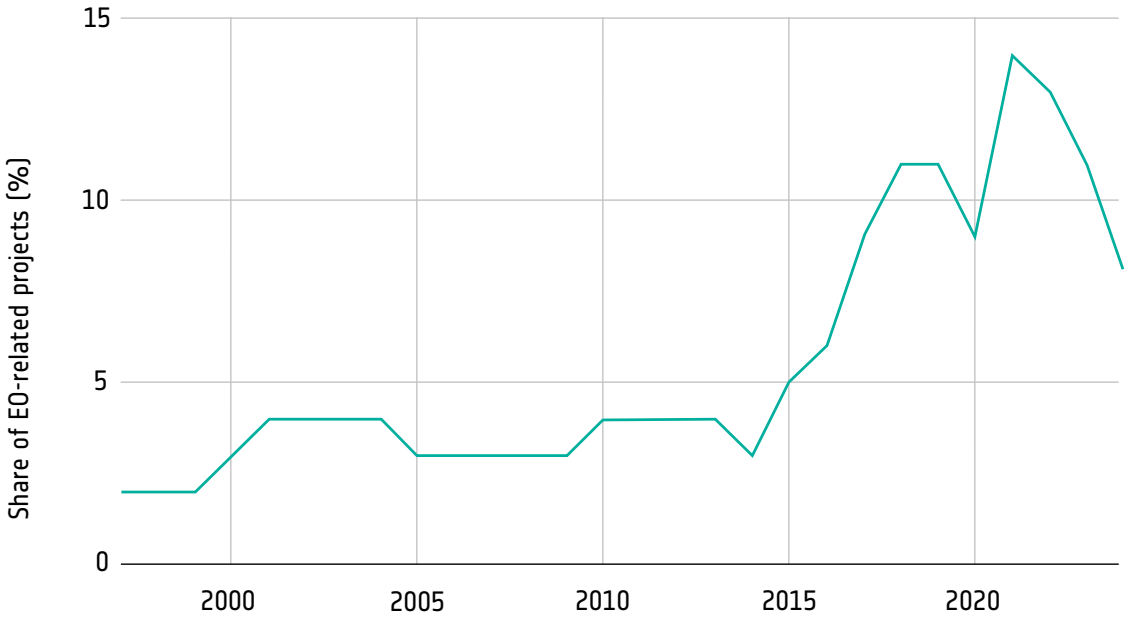
The share of EO-related projects at the WB grew from less than 4% of all projects between 1994 and 2014 before starting to rise over the last 10 years. A peak of 14% in 2021[10] may highlight the wider

10 This data was obtained using a text mining pipeline analysing the frequency of EO-related strings in WB project documents. Keywords used for this purpose were "satellite," "remote sensing," "Earth Observation," "geospatial," "imagery," and "EO4SD." Note that "GIS" was excluded as it returned too many unrelated projects (which may, in turn, result in false positives). Moreover, one current limitation with the set keywords is around "satellites," which also returns projects related to satellite

use of satellite data during and after the COVID-19 crisis, when field data collection was made difficult or impossible due to travel restrictions.

The OECD Creditor Reporting System, which tracks international development financial flows, also shows a general evolution of EO-related financial commitments from 1973 to 2022. Until the late 1990s, annual commitments were low before gradually increasing in 2000. Since 2017, the number of commitments has been rising sharply, showing the development sector's growing interest in EO technologies.

FIGURE 13: Proportion of WB Project Appraisal Documents Mentioning EO-related Keywords



European EO companies report IFI funding, with slight declines from WB and ADB, and IFAD emerging.

Stimulated through the GDA programme, the European Association of Remote Sensing Companies (EARSC) in 2022 included a dedicated part on IFI engagement in its annual industry survey for the first time. An analysis of the 2024 EARSC industry survey revealed that 11.3% of European EO companies who responded to the survey obtained funds from the World Bank, 4.8% from the ADB, and 1.6% from IFAD. 82% stated that they did not receive any funding from IFIs.

Compared to the 2023 survey results, this represents a decline in the proportion of companies obtaining funds from the World Bank (previously 20%) and the ADB (previously 7.6%), albeit this is a single year of trend. Additionally, funding from the IDB reported in 2023 (2.5%) was not observed in the 2024 survey, with IFAD appearing as a new IFI source instead.

communication rather than satellite EO (therefore creating false positives). Despite these measures, this use of keywords may not exclude false positives and false negatives.

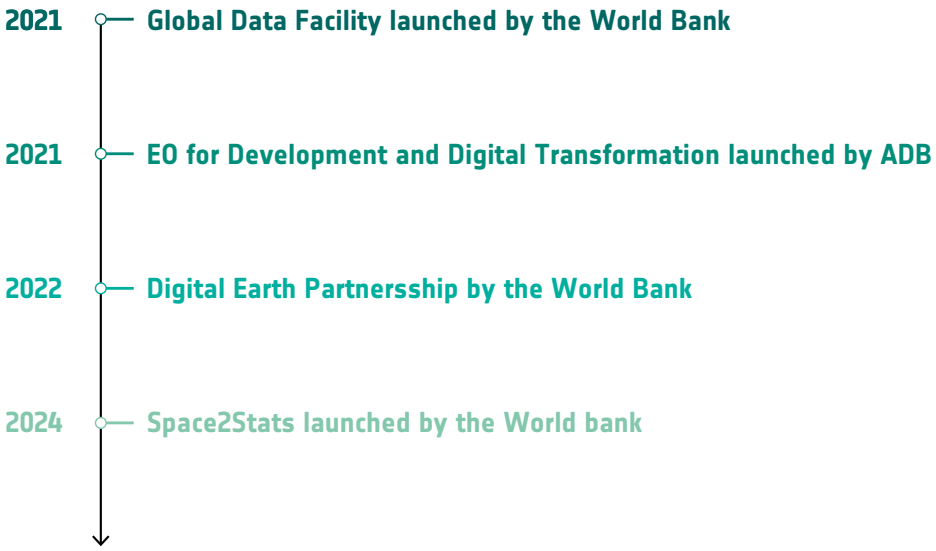
Indirect alignment of IFI resources

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

Between 2021 and 2024, major EO initiatives enhanced development, resilience, and geospatial data integration in WB and ADB.

Between 2021 and 2024, significant initiatives have advanced the integration of EO data into development efforts. In 2021, the ADB launched the EO for Development and Digital Transformation initiative to leverage EO data in decision-making processes. This was followed in 2022 by the WB's DEP, aimed at enhancing resilience to climate change and natural disasters through EO tools. Most recently, in 2024, the WB introduced Space2Stats,[11] providing consistent sub-national geospatial data to support economic analysis and policymaking. Together, these initiatives reflect a growing commitment to harnessing EO data for sustainable development.

FIGURE 14: Timeline of Key IFI Initiatives on EO



WB is incorporating EO technology through the Space2Stats initiative, integrating geospatial data into its fundamental development strategies.

The Global Data Facility, hosted by the WB, is a significant funding mechanism to transform (all forms of) data systems in low—and middle-income countries. Its ambitions are to mobilise at least US$500 million by 2030. The facility provides long-term support for building data capacity, improving data-driven decision-making, and addressing critical data gaps globally. Within this framework, Space2Stats has emerged as a critical component in advancing EO technology across WB operations.

11 WB, Space2Stats, https://worldbank.github.io/DECAT_Space2Stats/readme.html

Space2Stats integrates satellite and geospatial data with traditional datasets, such as surveys and administrative records, to offer deeper insights into development outcomes at sub-national levels. By standardising and making this data more accessible, the initiative has enabled the WB to apply EO technology in key areas, including food insecurity monitoring, climate risk assessments, and economic development planning.

> *"We see that in the World Bank's Global Data Facility which is a strategic umbrella trust fund, they now are considering to have a dedicated window, tentatively labelled 'Space Data Facility.' This is a very nice development—something that has not happened before."*
>
> **Chris Aubrecht, GDA programme coordinator, KII 2024**

ADB's integration of EO is driven by climate goals, sustainable development, and job creation through innovative partnerships and advanced technology use.

Integrating EO technology into ADB's financial operations is a strategic move supporting ADB's goals to drive nature-positive and climate-resilient outcomes while fostering job creation. As several Asian countries approach higher income levels and financial independence, ADB's ability to pair competitive financing with innovative EO solutions has become crucial. This alignment also supports ADB's position as a "climate bank," with substantial allocations earmarked for projects that promote climate resilience, such as eco-sensitive infrastructure projects.

> *"Presenting yourself to a customer to solve his problems with dollars is undeniable. But at the same time you have to present yourself with a very high level of innovation, mainly for two reasons one is job creation…the other is the fact that you have to do things that are nature positive and climate related… we are with ESA for this reason, i.e. because we introduce innovation and associate it, let's say, with the pure, unadulterated aspect of funding."*
>
> **Paolo Manuta, ADB project lead, KII 2024**

ADB's commitment to continuous technological evolution drives its interest in EO. As EO technologies advance rapidly, maintaining awareness of these developments allows ADB to leverage state-of-the-art solutions in its climate-related programmes.

IFAD integrates geospatial technologies to improve land tenure security and climate investments.

IFAD is integrating geospatial technologies, particularly GIS and EO, to improve the effectiveness of its rural development projects. These tools are being used to support land tenure security, particularly for indigenous and local communities. For example, IFAD's GeoTech4Tenure initiative, developed in collaboration with the UN Food and Agriculture Organization, combines geospatial technology and participatory methods to strengthen legitimate property rights in land investments.[12] In addition, IFAD is promoting the use of geospatial tools to target climate-related investments, as outlined in the Catalogue of Geospatial Tools and Applications for Climate Investment.[13]

12 IFAD, GeoTech4Tenure: Technical guide on combining geospatial technology and participatory methods for securing tenure rights, 2022, https://www.ifad.org/en/w/publications/geotech4tenure-technical-guide-on-combining-geospatial-technology-and-participatory-methods-for-securing-tenure-rights

13 IFAD, Catalogue of Geospatial Tools and Applications for Climate Investments, 2022, https://www.ifad.org/en/w/publications/geospatial-tools-and-applications-for-climate-investments

More recently, IFAD launched the Capitalising on Earth Observation Data to support Project Design, Implementation and Evaluation (CAPEO) project, which offers up to US$1.2 million in grants to further capitalise on EO data in project design, implementation, and evaluation, underscoring its growing commitment to these technologies.[14]

Other partnerships

ESA is in the process of establishing a partnership with EBRD to improve EO integration.

Under the GDA programme, ESA is currently developing a partnership with the European Bank for Reconstruction and Development (EBRD).[15] This partnership aims to integrate EO data into EBRD's sustainable development projects, focusing on improving monitoring and evaluation efforts, particularly for climate and green economy initiatives. By incorporating EO technology, the partnership will support EBRD's goal of allocating 50% of its funding to climate-related projects. It will also provide new tools to track progress, improve project impact assessments and align with the Paris Agreement. The partnership aims to promote the operational use of EO data and build local capacity, providing scalable solutions for sustainable development in the regions where EBRD operates.

Summary

The GDA programme has made significant progress in mainstreaming EO technologies into IFI operations. Through its EOIDs, GDA has demonstrated the value of EO tools in improving decision-making, planning, and operational efficiency. These EOIDs have provided granular insights across multiple sectors, enabling IFIs and CSs to address complex challenges such as climate risk assessment, water resource management, and agricultural resilience. Examples of transformative impacts include better data-driven project designs, refined policy development, and the integration of EO tools into ongoing national workflows. Notably, EO-enabled projects have led to structural changes in some CSs, such as the establishment of GIS-focused roles and improved geospatial capacity.

The programme's ability to foster innovation has been demonstrated by initiatives that extend the use of EO beyond the demonstration phase, with some IFI projects adjusting their approaches and scaling up EO-based solutions for wider applications. In addition, the GDA has catalysed partnerships between IFIs, CSs, and EO service providers, creating momentum for cross-institutional collaboration and co-investment. This progress reflects growing awareness and institutional interest in EO technologies and their potential to address sustainable development goals and climate challenges.

Despite these achievements, there are still barriers to the full mainstreaming of EO technologies. Challenges include limited scalability of EOIDs due to proprietary constraints, misalignment of some EO solutions with specific IFI and CS needs, and variability in the technical capacity of CSs to integrate EO into their systems. High upfront resource requirements, such as investment in training and capacity building, have also slowed the adoption process in some cases. In addition, bureaucratic complexity within IFIs and frequent leadership changes in CSs have hindered the momentum needed for long-

14 IFAD, Call for proposals: IFAD grant for supporting the use of satellite data in project design, monitoring and evaluation, 2024, https://www.ifad.org/en/w/calls-for-proposal/call-for-proposals-ifad-grant-for-supporting-the-use-of-satellite-data-in-project-design-monitoring-and-evaluation

15 GDA, ESA and EBRD discuss partnership pathways to amplify space-based data integration in global development, 9 April 2024, https://gda.esa.int/2024/04/esa-and-ebrd-discuss-partnership-pathways-to-amplify-space-based-data-integration-in-global-development/

term adoption.

The holistic impact of EO is evident in its ability to bridge the gap between technical innovation and practical application in development contexts. While EO adoption within IFIs is growing, achieving full mainstreaming will require addressing these persistent challenges and improving the adaptability and usability of EO solutions in diverse institutional and geographic contexts. In its current form, the GDA programme has laid a strong foundation for transforming development practice through EO integration and has positioned itself as a key player in advancing the use of geospatial technologies for sustainable development.

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, as per the Executive summary.

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 CSs in developing countries. These launched between late 2021 and 2024 and currently focus on eleven thematic areas.[16]

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 AID activities do not cover or that target different IFI organisations.
- **Modular Learning Content (MLC)** was launched in November 2024. It is a dedicated knowledge-sharing and advocacy activity featuring interviews with IFI senior management, project implementation staff, and in-country stakeholders, with a focus on the demand side.

GDA is implemented in partnership with IFIs—the 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 Partnership[17] and the ADB EO for Development and Digital Transformation Initiative.[18] 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, 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; financial support) from an IFI project investment (e.g., training sessions on GDA AID products as part of the GDA contracts are not counted).

16 ESA, Thematic Areas – GDA AID, https://gda.esa.int/thematic-areas /

17 WB Global Facility for Disaster Reduction and Recovery, Digital Earth, www.gfdrr.org/en/digitalearthpartnership

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

- **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.

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 organisations[19] from 14 participating states.[20] These consortia are selected via a competitive Invitation to Tender (ITT) process led by ESA. Each consortium then implements its activity within 18 months.[21]

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

20 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/

21 Timeline extended to 21 months for latest thematic areas.

Annex two: Evaluation methodology

To assess progress towards the GDA programme objectives and their 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 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:

- The status of programme implementation
- Assumptions underlying the delivery of outputs
- The status of output delivery
- Changes in outcomes
- Assumptions underlying the achievement of desired outcomes

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 aggregated GDA AID Task 4 User Feedback questionnaire results. Additionally, Caribou 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 (KIIs) have been conducted to complement ongoing programme monitoring with IFIs, ESA, and the GDA consortia members. All interviews were held over Zoom between July and November 2024. A total of 38 interviews were held: 16 with GDA consortium leads and members, 9 with ESA staff, 6 with ADB project leads, and 6 with WB project leads. The same data analysis framework (based on the key evaluation questions) was applied to the coding and analysis of these interviews.

- **Surveys.** In October 2024, a survey was conducted with 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. In November 2024, a dataset about IFI alignment was compiled by ADB project teams; the database for the WB is still under development. Data from the Task 4 questionnaire, administered to IFI teams by GDA consortia, was also used.

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.

Explore GDA #AcceleratingImpact at gda.esa.int
Contact us via gda@esa.int