



GEO Mid Term Evaluation Report

21st GEO Programme Board Meeting, 28 September 2021

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AGENDA



1 OBJECTIVES

2 KEY FOCUS AREAS

3 FINDINGS AND RECOMMENDATIONS:
TAKING STOCK OF SUCCESSES AND
CHALLENGES

1. Objectives

1

Address the scope of activities within GEO’s Work Programmes 2016 and 2017-2019, with a primary focus on the Strategic Objectives and the expected results outlined in the Strategic Plan 2016-2025;

2

Assess to what extent the priorities identified in the Mexico City Ministerial Declaration have been realized

3

Refine directions set out in the GEO Strategic Plan to take into account emerging trends and challenges.

Scope

Assessing GEO’s progress on its objectives at the midpoint of its Strategic Plan implementation.

Timeframe

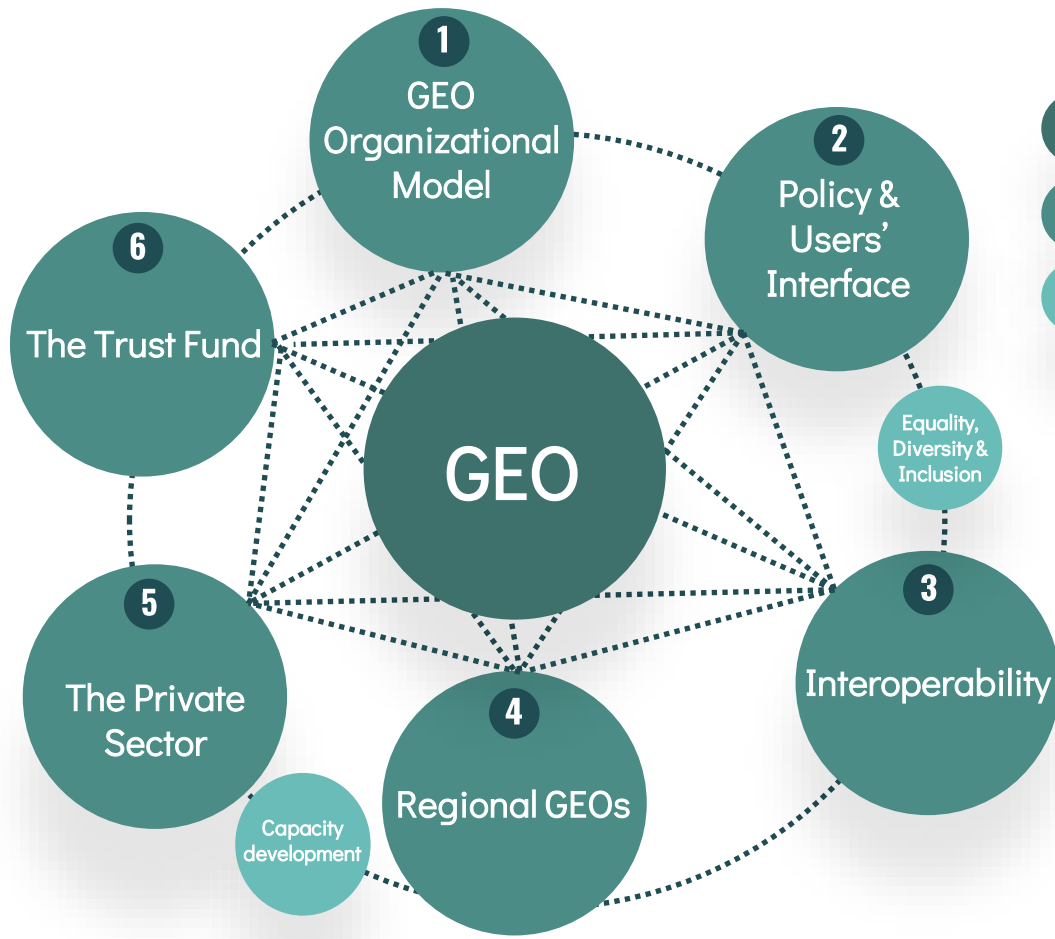
The mid-term evaluation includes years from 2016 to 2019 of the Strategic Plan 2016- 2025: Implementing GEOSS.

Evaluation Questions

The mid-term evaluation will address five evaluation questions from the ExCom TORs.

2. Key Focus Areas

Following an initial analysis of the collected data, the MTE Team selected **6 Key Focus Areas** that would address the questions of the Executive Committee (MTE TORs).



LEGEND:

-  Group on Earth Observations
-  Key Focus Areas
-  Other relevant topics embedded throughout the report

2.1 GEO Organizational Model

MISSION

- Good progress on its mission
- GEO's value and convening role
- Strengthening GEO-WMO relation

VALUE PROPOSITION

Need to better define GEO value proposition through the identification of areas of focus

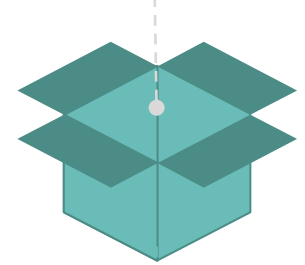
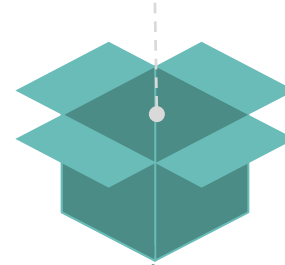
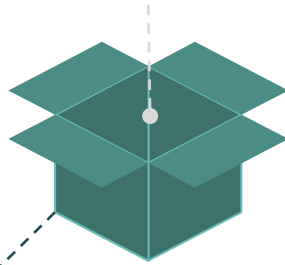
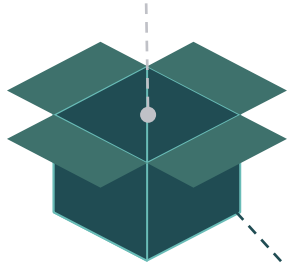
COMMUNICATION AND ENGAGEMENT

Inconsistent methods of internal communication and coordination to share information across GEO

RE-EVALUATING GEOSS

- Assessment of GEOSS concept,
- Its main goals and focus,
- Relevance of GEOSS overall

KEY FINDINGS



RECOMMENDATIONS



2.2 Policy and Users' Interface

RELATIONS WITH UN AND OTHER STAKEHOLDERS

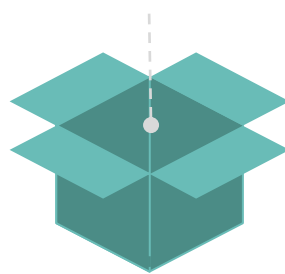
- Engagement with UN and MEAs has improved
- Relations with MDBs, statistical agencies and value proposition could be improved



Better define the GEO value proposition and focal themes in line with the thematic focal areas or flagship-centered strategy

USERS' NEEDS

No systematic mechanism to report on users' needs and requirements and to keep in contact with the users' base



Reporting and connecting with users' needs to be embedded across the GEO Work Programme in a cohesive manner

The GEO Value Chain



KEY FINDINGS

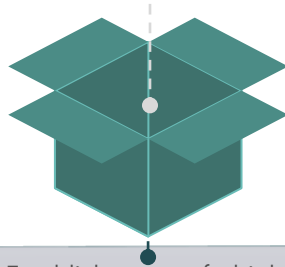
RECOMMENDATIONS

2.3 Organizational Interoperability

ORGANIZATIONAL INTEROPERABILITY

INTERNAL PROCESSES AND CONNECTIONS

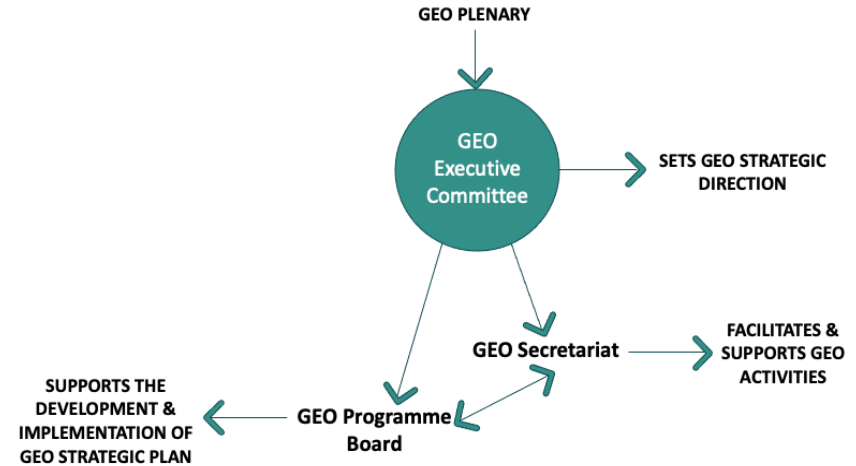
- Balance bottom-up approach with clear, high-level vision and focus
- Greater communication, coordination and interoperability are needed across GEO and the GWP



Establishment of high-level focal themes to drive synergies across the GWP and to be executed by the PB, GEOSEC and GWP. In order to advise on this selection team(s) can be set up within or by the ExCom that can advise on:

- improving connections between GWP activities,
- improving knowledge sharing using the new Knowledge Hub,
- providing recommendations on GWP development,
- connecting Regional GEOs.

The GEO Leadership Structure



KEY FINDINGS

RECOMMENDATIONS

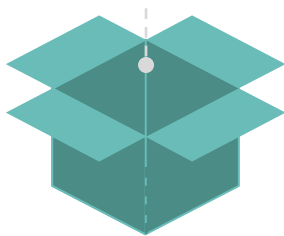
2.3 Technical Interoperability

TECHNICAL INTEROPERABILITY

EXTERNAL AND TECHNICAL INTEROPERABILITY

GEOSS Portal is unable to meet users' expectations:

- Better integration of in situ data
- More interoperability
- Knowledge Hub as a positive development



Review the content of the GEOSS Implementation Plan to make sure it:

- i. has good links with key global, regional and national data portals,
- ii. addresses gaps in the integration of in situ data,
- iii. connects GEOSS and the Knowledge Hub.

Strengthen the work of the In Situ data SG of the Data WG and continue GEO work in the promotion of data sharing/management principles on in situ data.

Technical Interoperability and External Connectivity



- 1 Continue promoting data sharing and management principles
- 2 Increase connectivity and complementarity among global, regional, national and other systems
- 3 Increase integration of GEOSS and the Knowledge Hub, considering and balancing other GEO relevant priorities

2.4 Regional GEOs

KEY FINDINGS

ROLE OF REGIONAL GEOs

- Need to integrate Regional GEOs more in the WP and GEO structure
- Possible roles to play in five key areas of GEO activities

CAPACITY DEVELOPMENT

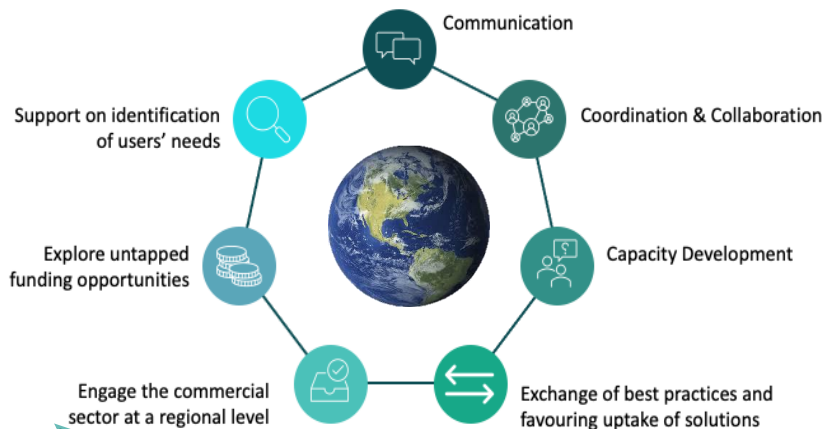
Key role of Regional GEOs in the implementation of GEO capacity development strategy because of their knowledge of users



Increased contribution in:
 i) communication/coordination,
 ii) capacity development,
 iii) exchange of best practices and uptake/scaling of products,
 iv) connecting with commercial sector (SMMEs) and potential donors.
 Consider solutions of the MTE Team to strengthen Regional GEOs.

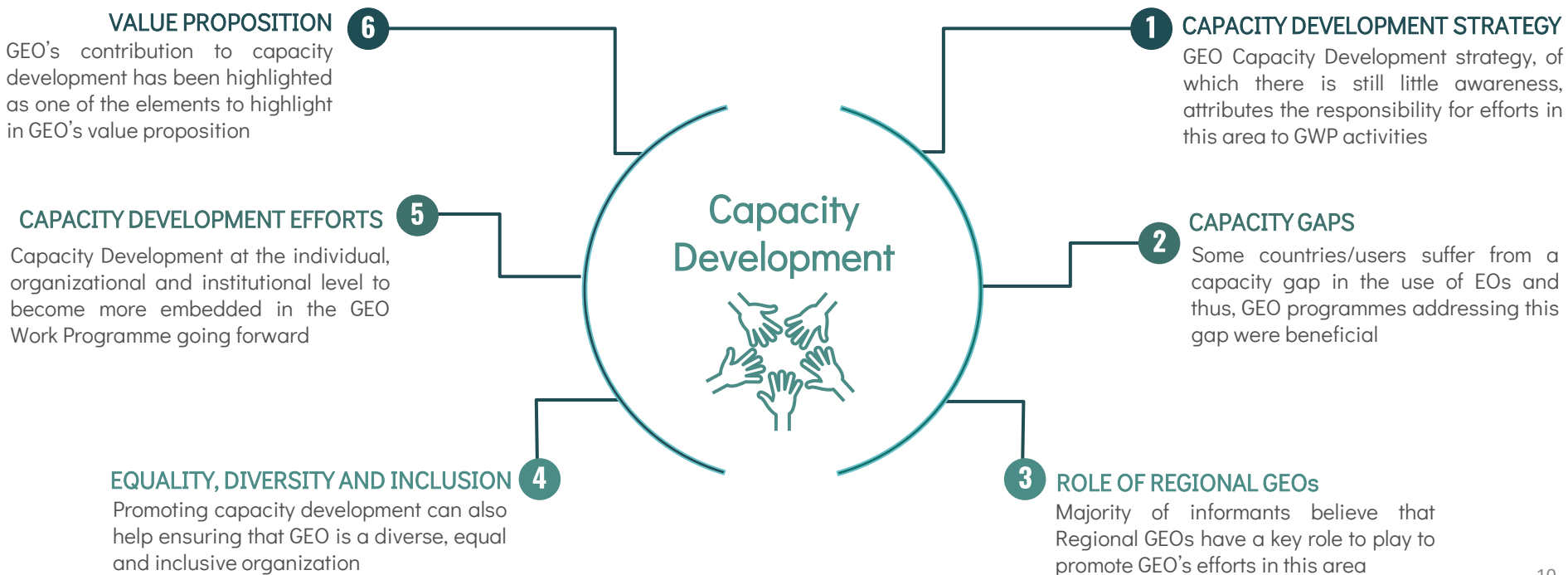
RECOMMENDATIONS

Contributions of Regional GEOs



2.5 Capacity Development

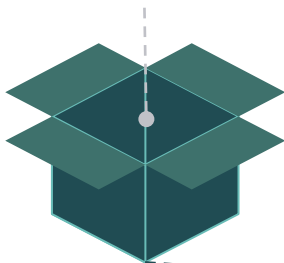
Capacity Development has been addressed as one of the transversal focus areas of the report. It is connected to the six key focus areas of the report, following a request from the Executive Committee to further focus on this topic.



2.6 The Private Sector

ENGAGEMENT WITH THE PRIVATE AND COMMERCIAL SECTORS

- Engagement with these sectors is positive
- Better define the value proposition
- Expand Rules of Engagement



CLOUD CREDITS AND LICENSE PROGRAMMES

- Positive example of engagement
- Make the benefits long-term
- Invest in capacity development



SMALL, MEDIUM AND MICRO ENTERPRISES

Need to engage more with companies of different sizes and from different geographies addressing the barriers they may have



KEY FINDINGS

RECOMMENDATIONS

Increase engagement with the commercial sector engaging all players:

- Action plan to engage different types of companies,
- Increase awareness on the Rules of Engagement and expand principles on IPR and privacy (Data WG)
- Use of various mechanisms for a consistent engagement framework
- Brokering role for the Secretariat and Regional GEOs (in particular with SMMEs)

2.7 The Trust Fund

KEY FINDINGS

AWARENESS

General lack of awareness on the Trust Fund and its role in support of the Secretariat and the arrangement between GEO and the WMO



FUNDING MODEL

Preference for maintaining the current model and expanding it by better defining GEO value proposition

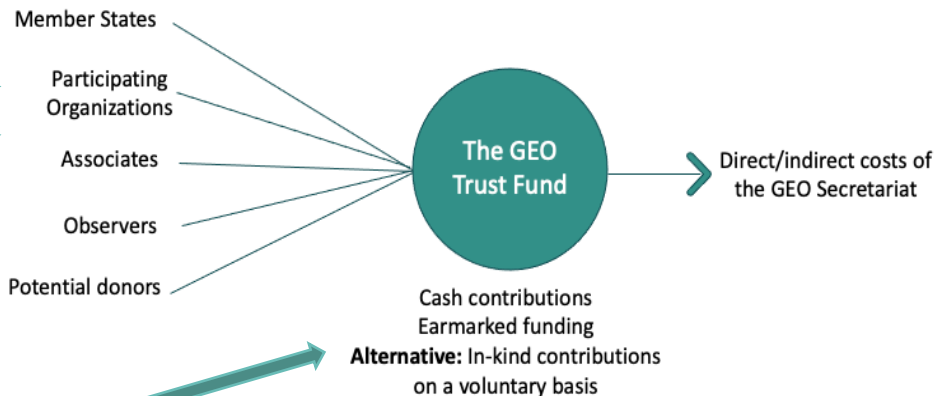


RECOMMENDATIONS

Favour awareness of the TF and encourage contributions by communicating value proposition and importance of the GEOSEC:

- Using public campaigns,
- Encouraging secondments and in-kind contributions using the VISC,
- Promoting the value of GEO,
- Exploring potential donors not approached yet.

The Trust Fund Model



2.7 The Trust Fund



Alternative Trust Fund Models

- Pay to play clause (applicable to ExCom membership)
- Minimum contribution for all
- 2-year free trial and then compulsory contribution
- Establishment of a National GEO (in-kind contribution)
- Risk of losing contributors and member states with requirement for a minimum contribution
- May risk limiting the promotion of equality, diversity and inclusion

Existing Trust Fund Model

- Expanding membership and/or existing contributions according to the VISC
- Advertise and communicate more the role of the Trust Fund and of the GEO Secretariat
- Explore potential funding opportunities, diversifying donors' base

Better defining GEO's
Value Proposition

PREFERRED CHOICE

3. Findings and Recommendations: Taking Stock of Successes and Challenges

GEO has been successful in:

- 1 Convening and facilitating interactions among key stakeholders in the EO field
- 2 Promoting opportunities for data sharing and service delivery
- 3 Promoting opportunities for cooperation among key stakeholders and across the EO Value chain



GEO Leadership areas for future improvement and next steps:

- 1 Clearly define high-level priorities to guide its work
- 2 Reassess GEOSS and its evolution
- 3 Better define GEO's value proposition and communicate it



Acknowledgements

The MTE Team **thinks all interviewees and survey respondents** for providing their contributions and insights on the Group on Earth Observations (GEO) and the Global Earth Observations System of Systems (GEOSS). The MTE Team would also like to thank **the GEO Executive Committee and the GEO Secretariat** for the support they provided throughout the evaluation and for their helpful contribution in advertising the MTE surveys and interviews. Finally, the MTE Team has been indebted to the support that **Chiara Caimi (M&E Consultant) and Samantha (Sam) Reeves (UK Research and Innovation)** have provided throughout the realization of the report.

A satellite-style map of the Earth, showing the continents of North America, South America, Africa, Europe, Asia, and Australia. The map is centered on the Atlantic Ocean, with the Americas on the left and Europe, Africa, and Asia on the right. The oceans are a deep blue, and the landmasses are shown in shades of green and brown, indicating vegetation and terrain. The map is set against a dark blue background, suggesting the Earth is seen from space.

Thank you!
Q&A

MTE Team Members

The Mid-Term Evaluation Team was selected following a nomination process by GEO Principals for experts to join the evaluation panel. Team members are:



Adrian Broad

European Union Manager, UK Met Office



Kate Hamer

Deputy Director International, UK Research and Innovation



Justyna Nicinska

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Surekha Ramessur

Divisional Meteorologist, Meteorological Services of Mauritius



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Mark Dowell

Senior Research Officer, Joint Research Centre of the European Commission



Lim Ze Hui

Director, Technical Training Division, Malaysian Meteorological Department



Johan Pauw

Managing Director, South African Environmental Observation Network (SAEON)



Yoshihisa Shirayama

Associate Executive Director, Japan Agency for Marine-Earth Science and Technology



Chiara Caimi


Monitoring and Evaluation Consultant

Samantha Reeves

Support to the MTE Team

2. Methodology

1 Methodology and Scope of Data Collection for the MTE Report



REVIEW OF KEY DOCUMENTS

- Past evaluations
- GEO official and unofficial documents
- External literature



INTERVIEWS

62 interviews in total, of which:

- 36 with key informants
- 9 with Secretariat staff
- 17 targeted interviews



SURVEYS

143 respondents in total:

- 117: Community survey
- 9: Secretariat survey
- 17: Commercial sector and Associates survey



CASE STUDIES

Value chain analysis of **5 activities**:

- GEOGLAM
- GOS4M
- Blue Planet
- Digital Earth Africa
- GEO-CRADLE



The COVID-19 pandemic has impacted the timeline and work approach of the MTE Team

2 Additional Data Collection

Governance Bodies

The MTE Team interviewed:

- 11 members of the Programme Board and
- 9 members of the Executive Committee

Geographic Representation

The MTE Team has conducted targeted interviews to increase the representativeness and overall diversity of the sample

2.1 Overview of the Sample

143

Respondents to the MTE web-based surveys

62

Interviews with the GEO community

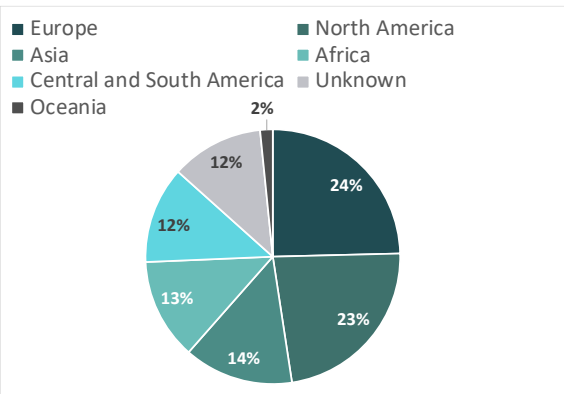
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Case studies with a value chain analysis

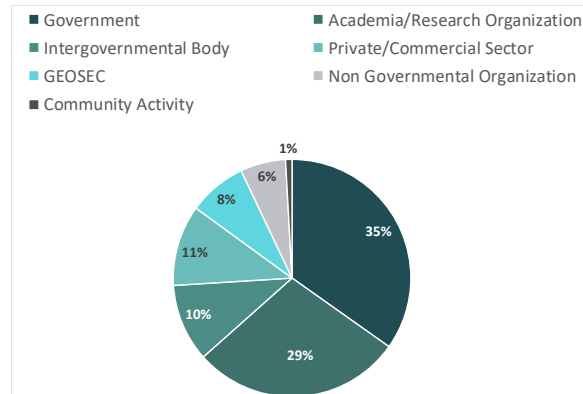
Representativeness

Respondents are from 44 countries and respondents from developing countries represent 26% of the sample.

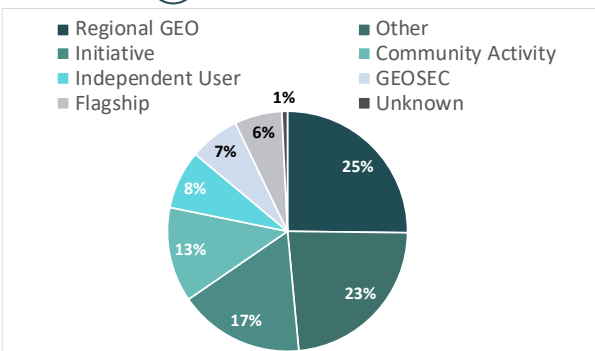
1 Geographic Composition



3 Institutions



2 Areas of Work



5. Annex: Key Focus Areas

This table maps the five questions posed by the ExCom against the key focus areas of the report

QUESTION	GEO's NARRATIVE	POLICY & USERS' INTERFACE	INTEROPERABILITY	REGIONAL GEOs	THE PRIVATE SECTOR	THE TRUST FUND
1. What results have been realized with respect to GEO's strengthened focus on users and stakeholders; in particular, on working with United Nation institutions, multi-lateral environmental agreements, multi-lateral development banks, statistical agencies, and the private sector?	✓	✓	✓	✓	✓	✓
2. What results has GEO achieved with respect to increasing the use, sharing and availability of Earth observations in implementing GEOSS as stated in the Strategic Plan?	✓	✓	✓	✓		
3. What evidence exists for the influence of Earth observation information products and services developed, produced or delivered through GEO Work Programme activities on decision making (by individuals, organizations, governments, etc.) and what evidence is there of benefits derived from such influence?	✓	✓	✓	✓	✓	
4. How has the implementation of "GEO engagement priorities" impacted GEO's work, including on: the GEO Work Programme, the GEO Secretariat, GEO governance bodies (GEO Plenary, Executive Committee, Programme Board, Regional GEOs), relations with GEO Members and Participating Organizations, and relations with other organizations?	✓	✓	✓	✓	✓	
5. To what extent have the changes introduced in the GEO Strategic Plan 2016-2025 impacted the effectiveness of the GEO Work Programme, decision flows and interactions amongst GEO governance bodies, and increased mobilization of resources to the GEO Trust Fund?	✓			✓	✓	✓

5.1 Annex: Findings and Recommendations

FINDINGS

RECOMMENDATIONS

#1 Mission: GEO is making good progress on working towards becoming a world leading organization in coordinating availability, access and use of Earth observations. It is successfully contributing to unlocking the potential of Earth observations by connecting the demand for sound and timely environmental information with the supply of data and information about the Earth, facilitating their accessibility and application to global decision-making within and across many different domains. It has an opportunity to become increasingly recognized as a global convener of different communities including member states, international organizations, data and service providers, users and the private sector in the field of Earth observations given the increasing availability of data, increasing attention towards sustainability topics and the need for information that can support decision-making in this field. It can fulfil the above-mentioned role by leveraging its ability to connect such communities, particularly with a view to covering the downstream of the value chain, providing a platform for collaboration and representing a source of branding, recognition and trust. As regards the GEO-WMO relationship, respondents noted the need to better define and strengthen this relation, highlighting possible areas of complementarity.

#1 GEO should improve the definition, targeting, communication of and emphasis on its value added proposition and benefits derived for external organizations to participate in GEO. Possible ways to do this include stressing GEO's messaging around its value added, its convening role, inclusivity and capacity development to foster greater engagement of all its existing and potential members, Participating Organizations and Associates. While no change is suggested to GEO's legal status and its Standing Agreement with the WMO, this specific relation, which is also administrative in nature, should be reviewed to identify possible areas of cooperation in light of recent improvements, taking into consideration the suggestions provided in the report.

#2 Value proposition: A clear gap that is evident across GEO is the need to better define its value proposition. A clearly defined value proposition is missing from messaging to members, but also to external partners, including UN institutions, and partners, such as the private sector. GEO's voluntary nature can be an asset, but this needs to be tempered with a clear organizational vision that is communicated within the GEO community and to potential partners and funders. A part of this clarity will require greater interaction with individual members to better understand their needs and where GEO can contribute and what GEO can offer, for instance in convening, addressing capacity gaps, providing access to open Earth observation data or in the standing up of National GEOs. GEO's struggle to attract new donations to its Trust Fund can be partly tied to the lack of understanding among key stakeholders of the value of GEO coupled with a lack of communication/marketing of the value of GEO to the global community, as well as at the regional and national level. To define its value added, GEO should agree on specific areas of focus where it can deliver, in light of developing technologies relative to its founding goals and its convening function. There is a sense in the GEO community that the next phase of GEO should be more action-oriented on what GEO can deliver and where it can make unique contributions to establish itself as a global leader in Earth observation.

5.1 Annex: Findings and Recommendations

FINDINGS

RECOMMENDATIONS

#3 Communication and Engagement: From the surveys and interviews, it was shown that there are inconsistent methods of internal communication and coordination to share information across the GEO Work Programme and to engage both current and potential members and users. This has limited GEO's ability to advance as an organization. There is also a widespread perception that because of this lack of communication and engagement, many members are not involved or contributing as meaningfully as they could to the work and funding of the organization.

#2 From an operational point of view, GEO should improve internal and external communication, as well as synergies among the different elements of the Work Programme, GEO governance bodies and the Secretariat, and to all of GEO relevant stakeholders, ensuring that frequency and content of communication is consistent across the organization and includes targeted communication on key items and decisions regarding the entire organization.

#4 Re-evaluating GEOSS: GEO needs to reassess the concept of GEOSS, what the main goals are, and whether the original concept of GEOSS remains relevant to the organization without modifications. Specifically, GEO should evaluate and decide what it wants or needs to pursue in terms of data infrastructure, producing data products, and user services, how GEOSS can integrate and execute the Knowledge Hub, and whether GEO has the capacity to carry this out. GEO is presently pursuing a wide range of functions, which fall into three main areas of GEO's focus including, serving as a convener, facilitator of access to open data, and user services. GEO should establish its focus going forward in terms of which of these roles should be prioritized given that it has limited resources and capacity. There is a balance needed between support for the upstream and downstream of the Earth observation value chain. Clearly defining where GEO can have the most profound impact will help ensure a lack of mission or scope creep, coordination with UN and other bodies, and clarity on what GEO can deliver to its users and stakeholders.

#3 Given that the evaluation has highlighted that the concept of GEOSS and its implementation has come to assume different meanings across the organization, GEO should consider assessing the concept of GEOSS in light of the recent evolution of GEO. To do so, GEO should consider establishing an Expert Advisory Group composed of external experts, with expertise in Earth observation science, user engagement, as well as socioeconomic and policy domains, and internal members, to explore to what extent the concept of GEOSS is still relevant to the organization as it no longer appears to define the core of GEO's activities as originally defined.

5.1 Annex: Findings and Recommendations

FINDINGS

#5 Relations with the UN and other stakeholders: In the past five years, GEO's engagement with the UN and multilateral environmental agreements has improved consistently. This was largely due to the establishment of the Engagement Priorities that allowed for a better alignment of agendas in the context of the SDGs, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction. However, there are opportunities to further improve relations with UN agencies both at a high policy level and at an operational level by deepening their collaboration with Regional, National GEOs and GEO Work Programme activities. GEO has made limited progress and it needs to work further to improve its relations with multilateral development banks and statistical agencies. There has been progress in this area over the past five years through Initiatives such as EO4EA and EO4SDGs making advancements, however GEO needs to continue to strengthen and expand these relationships across the organization. Strengthening such engagement would contribute to the establishment of a comprehensive ecosystem approach to the role of GEO in coordinating availability, access and use of Earth observations. Lastly, even though there has been progress in the engagement with the private sector and member states, better results can be achieved through a clearer definition of GEO value proposition.

#6 Users' needs: Despite the different approaches adopted to this topic, GEO has not developed a systematic mechanism to report on users' needs and requirements, ensuring that these are identified and addressed, especially when different needs emerge at a regional, national and local level. This situation might vary at different levels of implementation of the GEO Work Programme, where specific activities, in particular Flagships such as GEOGLAM and GOS4M, or some Initiatives such as GEO LDN, GEOGloWS and EO4SDGs, may have a better understanding of their users' base. Regional GEOs together with the GEO Work Programme activities: Flagships, Initiatives and Community Activities have been indicated as bodies within the GEO global structure that could play a central role in reporting on users' needs and ensuring that GEO maintains contact with its users' base.

RECOMMENDATIONS

#4 GEO has made good progress on developing its relationship with UN institutions over the past five years and should work on strengthening this relationship further at a global, regional, national, and local level. GEO should also work on improving its engagement with International Financial Institutions, statistical agencies and the private sector increasing awareness of its role in the Earth observations field. To this end, GEO would benefit from a clearer value proposition and targeted focal themes that can help to improve linkages and coordination within the GEO Work Programme, as well as with external stakeholders. It is recommended that GEO's Executive Committee should revisit the 'flagship-centered strategy' it once proposed as a way to establish clearer overarching priorities that can help to create synergies in the Work Programme and align them with key focal themes that are relevant to GEO's users and stakeholders.

#5 Reporting on and connecting with users' needs and their translation into requirements for products and services should be embedded in a more cohesive manner across the GEO Work Programme. GEO should consider a more structured way of collecting and consolidating requirements for their user community in a standardised format across the GEO Work Programme activities. GEO Work Programme activities should be expected to be able characterise and document these needs and requirements in a standardised format for their user community, by the time they reach the stage of a GEO Initiative. A greater role should be taken by Regional GEOs in collecting tailored requirements for their regions. The Programme Board should ensure that these needs and requirements are better integrated across GEO's system to guarantee the broad thematic scope of GEO engenders its full potential and to increase their capacity to link national and regional realities with the global GEO. GEO should also clarify how and if GEO activities should progress from a Community Activity to an Initiative to a Flagship. GEO should have greater clarity on the requirements to progress from one stage to the next and also on how many Flagships GEO should have, and when activities should remain at their existing level or when the latter should progress. In summary, there is limited guidance on the lifecycle of activities within the GEO Work Programme.

5.1 Annex: Findings and Recommendations

FINDINGS

#7 Internal processes and connections: The GEO Work Programme, while marked by bottom-up approaches and driven by coalitions of willing communities of practice, needs to be balanced with GEO's ability to maintain a clear vision and focus. The broad GEO Work programme would benefit from better coordination, improved communication and interoperability between GEO's implementation mechanisms. The scale of the current Work Programme makes this more challenging for the Programme Board and the GEO Secretariat to execute. Greater coordination at the thematic and regional level may help to reduce redundancies and improve integration. However, GEO needs to keep in mind that without additional resources (both within the Secretariat and from members) or improved rationalisation of existing activities it will be difficult to further expand the Work Programme while still maintaining its overall effectiveness and cohesion. The Executive Committee and Programme Board need to focus more on overarching thematic areas, and concrete goals for GEO providing more top-down direction, while balancing that with a bottom-up approach. The Societal Benefit Areas structure of the GEO Work Programme should be retained, alongside the Engagement Priorities to allow cross-cutting links. An increasing level of interaction between Regional GEOs should be encouraged. The new Knowledge Hub has a potential role to play in providing information to show how Initiatives, Community Activities, Flagships and Regional GEOs currently connect, placing an emphasis on the value chain of Earth observation to users and where GEO provides this across its different initiatives.

RECOMMENDATIONS

#6 GEO would benefit from establishing clearer high-level focal themes that can serve to drive synergies and improve coordination across the GEO Work Programme. That would be done by having them established at the Executive Committee level and then executed by the Programme Board and GEO Secretariat in coordination with the Work programme activities. It would be beneficial for the GEO Executive Committee to establish a team or teams, which can consider relevant international objectives and priorities of GEO's members that can in turn guide the identification of possible focal themes for GEO for a set number of years. This team, which is also encouraged to consult users and external communities, can advise the GEO Executive Committee on four important areas to improve synergies, knowledge sharing and reduce redundancies:

- i) improving connections between GEO activities that can link to high-level priority areas for GEO;
- ii) considering how these high-level focal themes will be benefitted by improved knowledge sharing and sharing of experiences using the new Knowledge Hub alongside other coordination mechanisms;
- iii) providing recommendations concerning the inclusion of further activities, and highlighting any gaps in the GEO Work Programme and the value chain on the use of Earth observation under the GEO Work Programme in consideration of the proposed focal themes; and
- iv) improved links between Regional GEOs, which will also need to be reflected in the proposed high-level focal themes approach.

5.1 Annex: Findings and Recommendations

FINDINGS

#8 External and technical interoperability: Despite recent attempts to improve it, the GEOSS Implementation Plan needs to be reviewed. The GEOSS portal, as described, is unable to meet user expectations in terms of its low technical capability, low performance compared with other global and regional systems, and the lack of good integration of in situ data. This view is supported by the low rates of use of the portal when compared with other global, regional and national portals. Technology advances have significantly changed the original concept for the GEOSS and GEO no longer has the tools, right partners or resources to meet the project GEO had intended in the early years (2005 – 2010) to build a system of systems. GEO would benefit from improved external connectivity with major Earth observation data portals, at all levels. Attention should be paid to links with global, regional and national data systems. Particular attention should be made to improving the availability and integration of in situ observations within the GEO Portal, working with in situ terrestrial, freshwater, coastal, ocean and atmospheric observation systems and new in situ initiatives such as GBON and others. It is believed that the new GEO Knowledge Hub could provide more support to the Earth observation value chain and, although still at an early stage of development, should become part of the GEOSS infrastructure. However, this development needs to be balanced against GEO's other priorities. Recently, the early development of the Knowledge Hub has required a high level of support from GEO Secretariat staff, and this heavy burden is not sustainable in light of other GEO priorities.

RECOMMENDATIONS

#7 GEO should review the content of the GEOSS Implementation Plan to make sure it i) has good links with key global, regional and national data portals; ii) addresses gaps in the integration and availability of in situ data; and iii) plans for appropriate use of the Knowledge Hub within the GEOSS overarching structure to demonstrate the value of Earth observation to decision makers. In particular, the work of the In Situ Subgroup of the Data Working Group should be strengthened to focus by GEO theme on in situ data gaps and access. GEO should continue promoting data sharing and management principles for in situ data, including how best to provide access to holdings of scientific networks, citizens' observation programmes, and non-government data providers.

5.1 Annex: Findings and Recommendations

FINDINGS

#9 Role of Regional GEOs: Interviews with key informants highlighted that Regional GEOs need to become more integrated into the functions of the GEO Work Programme and the overarching structure of GEO itself. The current level of coordination and communication within GEO is insufficient to facilitate better interactions at the local/national/regional level with users and stakeholders. Regional GEOs could play a key role in helping to coordinate GEO Work Programme activities at the regional level and facilitating communication within GEO by serving as an intermediary between the development of the GEO Work Programme, the Secretariat, Working Groups and the Programme Board fostering collaboration and identifying potential synergies among all these bodies. Regional GEOs can also help bolster the implementation of GEO's capacity development strategy by showing where capacity development gaps exist and how GEO's efforts can have the most impact at the institutional level and organizational level. Regional GEOs also have a role to play in promoting exchange on best practices across GEO and upscaling/downscaling successful products, leveraging opportunities for engagement with the commercial sector and exploring funding opportunities at the regional level.

#10 Capacity Development: Regional and National GEOs are in close contact with the users of GEO's EO-derived tools and services and as such these bodies, specifically when from developing economies, are also well-placed to identify and report on users' needs and requirements. These bodies would have a deeper understanding of local capacities and the level of expertise of defined categories of users' communities. Recognizing their role in support of capacity development will be important as GEO moves on to implement its capacity development strategy. Given that Regional GEOs have access to users they can tailor and scale solutions based on local conditions and priorities and have connections with other regional and national bodies.

RECOMMENDATIONS

#8 Given that the MTE has highlighted the need to better integrate Regional GEOs within the GEO overarching structure and Work Programme, GEO should consider possible solutions to promote an increased engagement, coordination with, and contribution of Regional GEOs across GEO's governance structure and Implementation Mechanisms. This increased engagement should not add another governance level, but rather utilize existing mechanisms for improved operations between the regional and global level of GEO. Given the unique characteristics of each Regional GEO, it should also ensure a balanced approach that allows flexibility for members and GEO activities to engage directly with GEO at the global level depending on regional preferences and dynamics. Regional GEOs contributions should be focused in five key areas:

- Improving overall communication and coordination across the GEO Work Programme and connection with the GEO Secretariat,
- Contributing to the realization of GEO's strategy on capacity development given their unique knowledge of users' needs and requirements based on existing capacities,
- Promoting opportunities for exchange of best practices and uptake/scaling of successful products that may be developed at a regional or subregional level,
- Leveraging opportunities for engagement with SMMEs at the regional level by brokering relations among the SMMEs, the Secretariat and GEO Work Programme activities,
- Exploring opportunities for the mobilisation of resources at the regional, national and local levels.

To strengthen the role of Regional GEOs, GEO should consider a role for Regional GEOs that would create synergies with other bodies. Some considerations include having a seconded expert to serve as a point of contact and coordination for Regional GEOs at the Secretariat; holding a regular coordinating call between Regional GEOs; organizing an annual event for Regional GEOs to share best practices or establishing a communication tool/platform that Regional GEOs could use to exchange information, organize virtual meetings, and share materials.

5.1 Annex: Findings and Recommendations

FINDINGS

#11 Engagement with the Private and Commercial Sectors: Engagement with the private sector has increased over the past five years and overall is seen as beneficial and having added to the value of GEO. However, key informants highlighted that lack of the private sectors' involvement or views in GEO's activities such as in designing of GEO tasks or Work Programme and rules of engagement with the commercial sector adopted by GEO, among others, is causing the private sector, in particular small commercial sector companies, to not fully participate or see the benefits of participating in GEO's activities/programmes. In this sense, many noted that GEO should better define its value proposition for the commercial sector and that the GEO Secretariat and Regional GEOs could play a role to help match and broker possible collaboration between commercial sector partners and Work Programme activities. The majority of respondents called for GEO to establish rules of engagement with the commercial sector including integrity, independency, privacy and ethics principles. The majority of interviewees were also unaware of the existence of the Rules of Engagement with the Commercial Sector, which already address some of these items. This points to the existence of a communication gap across the organization. Those who were aware of their existence, noted that these rules currently provide very general principles for engagement that GEO should develop further in the future to address IPR and privacy with a more comprehensive approach. Some informants believe GEO is not engaging enough with the commercial sector, especially those having better resources and technology and they feel GEO is lagging behind in the development and application of technologies compared to the commercial sector.

RECOMMENDATIONS

#9 In view of increasing its engagement with the commercial sector, GEO should try to address the needs of different commercial sector players that might be interested in getting involved, considering possible barriers to engagement and differences related to geography and size. To do so, GEO might consider adopting an action plan for engagement with the commercial sector, developing a targeted approach to address partnerships with companies of different sizes, sectors and geographies. While past engagements brokered by the Secretariat with Amazon, Google and Microsoft, and other engagements that developed at the Work Programme level have represented positive experiences, GEO should improve communication about these efforts across the GEO community. It should also increase awareness regarding the existence of Rules of Engagement with the Commercial Sector, that represent a flexible framework for engagement. A minority of the GEO community is aware of the existence of this framework, while many do not realize that this is already established.

Given that GEO already has some basic principles laid out on IPR, it should work to make these clearer, develop these further in light of the work of the Data Working Group on IPR and privacy and evaluate how it should engage with different opportunities, given the role it is asked to play in each exchange with the commercial sector. In doing so, GEO may wish to explore, based on the nature of the commercial sector engagement, the use of solutions as memoranda of understanding, or tools such as CRADAs to ensure the establishment of a set framework to carry out such engagements in a collaborative fashion. Lastly, Regional GEOs and the GEO Secretariat would be best placed to play a key role to foster engagement with the commercial sector by assuming a more central role in brokering engagement and matching potential partners at a regional and global level with GEO Work Programme activities. The potential for an incubator supporting SMMEs active in the field of Earth observations may also be considered.

5.1 Annex: Findings and Recommendations

FINDINGS

#12 Cloud Credits and License Programmes: The Cloud Credits and License Programmes have been mentioned by the majority as a positive example of engagement with the commercial sector with a clear value proposition aimed at promoting the use of Earth observations and skills development in developing countries. Informants suggested GEO should look at ways to make this engagement and the benefits derived from it become long-term by ensuring participants can retain and continue developing the skills acquired through the programme and that the programmes should become increasingly tied to the GEO Work Programme. By highlighting a disparity in the capacity levels of different participants, the programmes showed how further work is needed from GEO to support capacity development on the use of Earth observations.

#13 Small, Medium and Micro Enterprises: Even though GEO's engagement has increased in recent years, respondents feel that GEO has so far shown little or no satisfactory engagement with the commercial sectors in SMMEs. GEO is perceived to engage more with multinational technology companies that conform with the GEO rules of procedure or afford the prospects of big grants. SMMEs, on the other hand, cannot compete with what can be offered by bigger companies at the international level and have structural barriers to engagement represented by limited opportunities and resources. Key informants feel that GEO should also engage more with SMMEs, diverse companies from different geographies and with different sizes, particularly in developing and least developed countries, with a clear plan to address structural barriers and equally pursue involvement with all of them. This perception stems from miscommunication more so than a lack of interest on GEO's part to engage with the SMMEs where a lot of the engagement with SMMEs and companies not involved in the Cloud Credits and License Programmes happens at the level of the Work Programme and is not publicised by the Secretariat. Some of the structural reasons limiting SMMEs engagement can be helped by better coordination but calling for a "level playing field" misses some of the structural challenges and does not fully consider all of what GEO attempted to date. However, there is room for improvement, especially where the need to communicate better and clarify existing misconceptions is evident, and to improve coordination through an increased role of the Regional GEOs and the Secretariat.

RECOMMENDATIONS

#9 In view of increasing its engagement with the commercial sector, GEO should try to address the needs of different commercial sector players that might be interested in getting involved, considering possible barriers to engagement and differences related to geography and size. To do so, GEO might consider adopting an action plan for engagement with the commercial sector, developing a targeted approach to address partnerships with companies of different sizes, sectors and geographies. While past engagements brokered by the Secretariat with Amazon, Google and Microsoft, and other engagements that developed at the Work Programme level have represented positive experiences, GEO should improve communication about these efforts across the GEO community. It should also increase awareness regarding the existence of Rules of Engagement with the Commercial Sector, that represent a flexible framework for engagement. A minority of the GEO community is aware of the existence of this framework, while many do not realize that this is already established. Given that GEO already has some basic principles laid out on IPR, it should work to make these clearer, develop these further in light of the work of the Data Working Group on IPR and privacy and evaluate how it should engage with different opportunities, given the role it is asked to play in each exchange with the commercial sector. In doing so, GEO may wish to explore, based on the nature of the commercial sector engagement, the use of solutions as memoranda of understanding, or tools such as CRADAs to ensure the establishment of a set framework to carry out such engagements in a collaborative fashion. Lastly, Regional GEOs and the GEO Secretariat would be best placed to play a key role to foster engagement with the commercial sector by assuming a more central role in brokering engagement and matching potential partners at a regional and global level with GEO Work Programme activities. The potential for an incubator supporting SMMEs active in the field of Earth observations may also be considered.

5.1 Annex: Findings and Recommendations

FINDINGS

#14 Awareness: There is a general lack of awareness on the role of the Trust Fund and how it serves to support the operations of the GEO Secretariat, but also about the Standing Agreement and consequently the administrative arrangement in place between the GEO Secretariat and the WMO. This is demonstrated by the high percentage of respondents who chose not to address the question on the Trust Fund or declared they did not know enough to answer this question. This finding points to the need for systematic and continuous communication within the organization on priorities such as the GEO funding model, its functioning and role which allows the Secretariat to continue its operations.

#15 Funding Model: The majority of interviewees and respondents to the surveys are in favour of maintaining GEO’s voluntary funding model of best-effort cash or in-kind contributions to the Trust Fund. The majority believes that rather than shifting to a model requiring a minimum mandatory contribution, the current model should be optimized promoting an increase in the number of contributors, in the amounts contributed by each member and the number of in-kind contributions including secondments from member states, Participating Organizations and Associates. This can be done by promoting contributions according to the voluntary indicative scale of contributions, promoting public campaigns of support for GEO, exploring new funding opportunities and by enhancing members’ perception of GEO value proposition through continuous engagement and better communication. In fact, it seems that the underlying issue behind the low level of contribution to the Trust Fund is the need to better define GEO’s value proposition.

RECOMMENDATIONS

#10 To favour awareness of the Trust Fund, its role and function, and to encourage contributions to it from GEO members and stakeholders, GEO should communicate its value proposition more clearly across the entire organization and highlight the importance of the GEO Secretariat and the role it plays in coordinating GEO’s activities. This could be achieved by i) continuing to use public campaigns of commitment to show members’ engagement such as the GEO Pledge campaign, ii) encouraging secondments and other in-kind contributions from all GEO members in line with the amounts suggested in voluntary indicative scale of contributions, iii) promoting more the role and value provided by GEO as a leading organization in the field of Earth observations, and by iv) actively exploring potential donors that GEO has not approached yet in order to diversify its donor base.

5.2 Annex: Sample Composition

When defining the geographic composition of the sample, participants to the MTE surveys and interviews from the Secretariat were not accounted for as the region of origin of their institution is Switzerland and this would have biased the sample composition. Overall:

- The sample is composed of 187 answers
- Respondents' institutions are located in **48 different countries**
- The biggest percentage of respondents, **37%**, are from the **USA** and another **10%** is from **Ecuador**
- **26%** of respondents, 49 in total, come from institutions located in **26 developing countries**

Geographic Composition by Country of the Sample			
Country	Number	Percentage	
Argentina	1	1%	
Australia	3	2%	
Austria	2	1%	
Bangladesh	1	1%	
Belgium	6	3%	
Bolivia	1	1%	
Brazil	1	1%	
Cameroon	1	1%	
Canada	6	3%	
China	7	4%	
Colombia	1	1%	
Costa Rica	1	1%	
Czech Republic	1	1%	
Ecuador	10	5%	
Finland	1	1%	
France	5	3%	
Georgia	1	1%	
Germany	5	3%	
Ghana	2	1%	
Greece	2	1%	
India	3	2%	
Ireland	1	1%	
Italy	8	4%	
Japan	9	5%	
Kenya	4	2%	
Libya	1	1%	
Malaysia	1	1%	
Mexico	4	2%	
Nepal	2	1%	
Nicaragua	1	1%	
Niger	1	1%	
Nigeria	3	2%	
Norway	3	2%	
Peru	1	1%	
Rwanda	1	1%	
Senegal	1	1%	
South Africa	9	5%	
South Korea	3	2%	
Spain	1	1%	
Sweden	2	1%	
Switzerland	5	3%	
Trinidad and Tobago, Barbados	1	1%	
Ukraine	2	1%	
United Kingdom	2	1%	
Unknown	21	11%	
Uruguay	1	1%	
USA	37	20%	
Zimbabwe	1	1%	

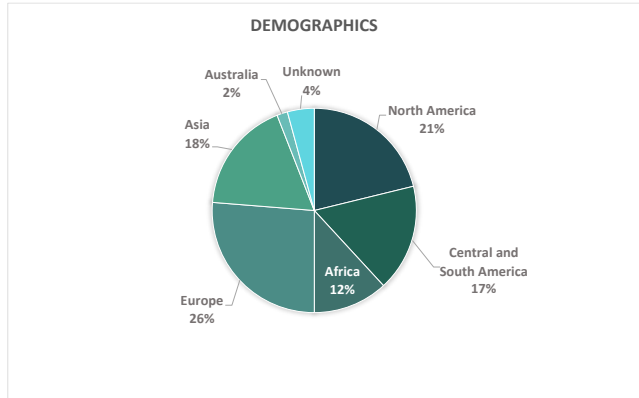
Geographic Composition by Country of the Sample (Developing Countries)			
Country	Number	Percentage	
Argentina	1	2%	
Bangladesh	1	2%	
Bolivia	1	2%	
Colombia	1	2%	
Ecuador	10	20%	
Ghana	2	4%	
India	3	6%	
Libya	1	2%	
Malaysia	1	2%	
Mexico	4	8%	
Nepal	2	4%	
Nigeria	3	6%	
Senegal	1	2%	
Ukraine	2	4%	
Niger	1	2%	
Zimbabwe	1	2%	
Kenya	4	8%	
Uruguay	1	2%	
Nicaragua	1	2%	
Trinidad and Tobago, Barbados	1	2%	
Cameroon	1	2%	
China	2	4%	
Brazil	1	2%	
Costa Rica	1	2%	
Rwanda	1	2%	
Peru	1	2%	

5.3 Annex: Community Survey

1 Geographic Composition



In which region is your institute based in?



Only the geographic composition of the community survey is provided as the institution of origin for respondents from the Secretariat is located in Switzerland and Commercial Sector and Associates respondents were not asked to indicate the region of their institution. Respondents to the community survey were 117 in total.

Geographic Composition		
Country	Number	Percentage
Argentina	1	1%
Bangladesh	1	1%
Bolivia	1	1%
Canada	5	4%
China	5	4%
Colombia	1	1%
Ecuador	10	9%
France	3	3%
Georgia	1	1%
Germany	5	4%
Ghana	1	1%
Greece	2	2%
India	3	3%
Ireland	1	1%
Italy	5	4%
Japan	6	5%
Libya	1	1%
Malaysia	1	1%
Mexico	4	3%
Nepal	2	2%
Nigeria	3	3%
Norway	1	1%
Senegal	1	1%
Switzerland	3	3%
Sweden	2	2%
South Korea	3	3%
United Kingdom	2	2%
Ukraine	2	2%
USA	20	17%
Czech Republic	1	1%
Niger	1	1%
Austria	2	2%
Zimbabwe	1	1%
Australia	2	2%
Spain	1	1%
Kenya	1	1%
Uruguay	1	1%
Nicaragua	1	1%
Trinidad and Tobago, Barbados	1	1%
Cameroon	1	1%
South Africa	4	3%
Unknown	4	3%

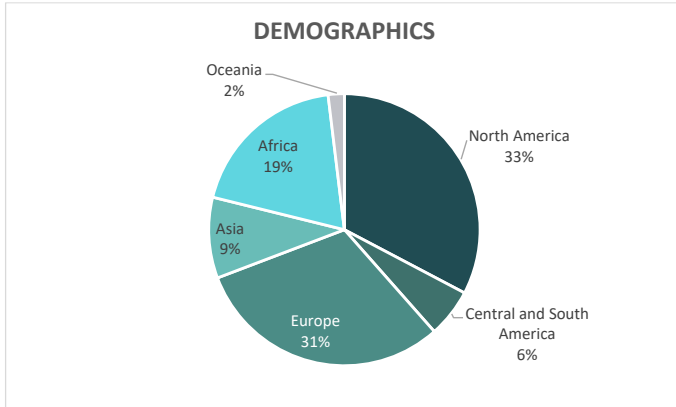
Demographics			
Region	Number	%	
North America	25	21%	
Central and South America	20	17%	
Africa	14	12%	
Europe	31	26%	
Asia	21	18%	
Australia	2	2%	
Unknown	4	3%	

5.4 Annex: Interviews

1 Geographic Composition



In which country is your institute based in?



Demographics		
Region	Number	%
North America	17	33%
Central and South America	3	6%
Europe	16	31%
Asia	5	10%
Africa	1	2%
Oceania	10	19%

Geographic Composition by Country of the Sample		
Country	Number	Percentage
Canada	1	2%
USA	16	31%
Kenya	3	6%
France	2	4%
South Africa	5	10%
Belgium	6	12%
Switzerland	2	4%
Finland	1	2%
Norway	2	4%
Japan	3	6%
Italy	3	6%
Australia	1	2%
Peru	1	2%
Costa Rica	1	2%
Brazil	1	2%
China	2	4%
Rwanda	1	2%
Ghana	1	2%

Only the geographic composition of the key informant and targeted interviews is provided as the institution of origin for interviewees from the Secretariat is located in Switzerland.. These interviews were 52 in total.

5.5 Annex: Key Focus Areas

1 GEO Organizational Model

1 GEO's progress towards the achievement of its Strategic Plan and Engagement Strategy

2 Role of GEO as a convener, SWOT analysis, **value proposition** and GEO-WMO relation

113 Member countries

135 Participating organizations

26 Associates and Observers

3 Engagement Priorities

8 Social Benefit Areas

Mapping GEO's Societal Benefit Areas against the Engagement Priorities

	Sustainable Development Goals	Paris Agreement	Sendai Framework
Biodiversity and Ecosystem Sustainability	SDG 14 and 15		
Disaster Resilience			
Energy and Mineral Resources Management	SDG 7		
Food Security and Sustainable Agriculture	SDG 2		
Public Health Surveillance	SDG 3		
Infrastructure and Transport Management	SDG 9		
Sustainable Urban Development	SDG 11		
Water Resources Management	SDG 6		

2 Policy & Users' Interface

1. Identification of users' needs at the WP level

2. Adding layers of value to EO data

3. Delivery of EO tools, services and products

Evaluation of GEO's role and success in connecting across the EO value chain with policymakers and users

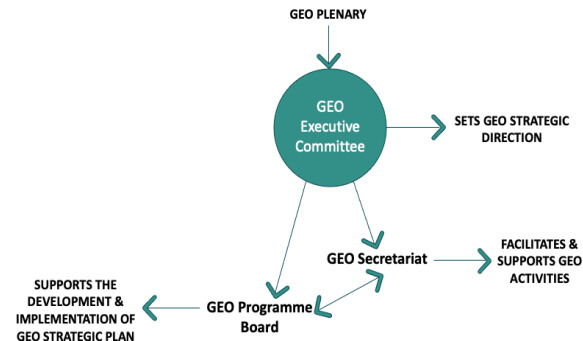
UPSTREAM: FOCUS ON USER NEEDS

MIDSTREAM: BRIDGING THE GAP

DOWNSTREAM: IMPACT-ORIENTED GEO

3 Interoperability

1 Organizational interoperability among GEO leadership bodies and the Work Programme activities

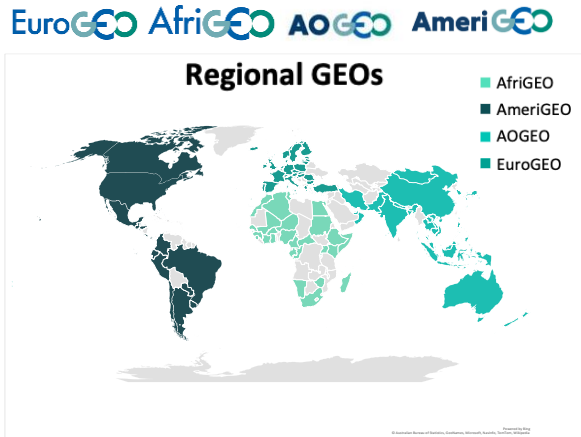


2 Technical interoperability enabling data access and interoperability among different data systems



5.5 Annex: Key Focus Areas

4 Regional GEOs



Analysing the role of Regional GEO in five key areas:

1. Communication and coordination across GEO
2. Advancement of GEO Capacity Development strategy
3. Opportunities for exchange of best practices and downscaling/upscaling
4. Opportunities for engagement of the commercial sector at the regional level
5. Alternative funding opportunities (regional level)

5 The Private Sector

- 1 Review of GEO's engagement with the private and commercial sectors
- 2 Review of GEO's Cloud Credits and License programmes with three companies
- 3 Review of GEO's actual and potential opportunities for engagement with SMEs



Expand on initial engagement by including more companies and better framing the engagement



Positive initial engagement with the commercial sector ✓

6 The Trust Fund

Analysis of the GEO Trust Fund Model:

- 1 Assessment of the GEO funding model and alternatives
- 2 Role of the GEO Trust Fund as an enabler of GEO prosperity and future growth
- 3 Expanding an optimizing the GEO Trust Fund model to ensure GEO's long-term sustainability

Alternative Models (ex. pay to play)

Preferred option: Existing Model ✓

5.6 Annex: GEO Work Programme Linkages

	Sustainable Development Goals	Paris Agreement	Sendai Framework	Societal Benefits Areas	Engagement Teams	Nexus
GEOBON	SDGs 2, 3, 6, 13, 14, 15			Biodiversity and Ecosystem Sustainability	Ecosystems	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity
GEOGLAM	SDGs 2, 8	Adaptation		Food Security and Sustainable Agriculture	Land	Water-Food-Energy Land-Food-Water-Biodiversity
GEOI	SDGs 13, 15, 17	Cap Dev/Tech Transfer, Reporting/Global Stocktake, Mitigation	Target G	Biodiversity and Ecosystem Sustainability, Food Security and Sustainable Agriculture	Ecosystems	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity
GOSAM	SDGs 3, 6, 12, 17			Public Health Surveillance	Atmosphere	Climate-Ocean-Biodiversity Climate-Health-Infrastructure Land-Food-Water-Biodiversity
AQUAWATCH	SDGs 6, 14			Public Health Surveillance, Water Resources Management	Water	Climate-Ocean-Biodiversity Water-Food-Energy Land-Food-Water-Biodiversity
BLUE PLANET	SDG 14	Mitigation	Target G		Water	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity
DIAS	SDGs 1, 2, 3, 6, 7, 8, 9, 11, 12, 13, 14, 15		Target A		Cross-cutting	Climate-Ocean-Biodiversity Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
EO4EA	SDGs 2, 6, 7, 8, 9, 11, 12, 14			Biodiversity and Ecosystem Sustainability	Ecosystems	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity Water-Food-Energy
EO4HEALTH	SDG 3		Target G		Urban	Climate-Health-Infrastructure
EO4SDG	SDGs 1, 2, 3, 6, 7, 8, 9, 11, 12, 13, 14, 15, 17				Cross-cutting	Climate-Ocean-Biodiversity Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
EDIS	SDG 6	Loss and Damage		Biodiversity and Ecosystem Sustainability, Food Security and Sustainable Agriculture, Water Resources Management	Land	Water-Food-Energy Land-Food-Water-Biodiversity
GEO-DARMA				Disaster Resilience	Disasters	Climate-Health-Infrastructure
GEO-GNOME	SDGs 1, 2, 3, 6, 7, 9, 13, 15	Adaptation, Loss & Damage, Cap Dev/Tech Transfer, Reporting/Global Stocktake, Mitigation	Target A, B, C, D, G	Biodiversity and Ecosystem Sustainability, Disaster Resilience, Water Resources Management	Cross-cutting	Climate-Ocean-Biodiversity Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
GEO-LDN					Land	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity
GEO-VENER	SDG 7	Adaptation, Loss & Damage, Cap Dev/Tech Transfer, Mitigation	Target C, D	Energy and Mineral Resources Management	Atmosphere	Water-Food-Energy Climate-Health-Infrastructure
GEO-WETLAND	SDGs 6, 15	Reporting/Global Stocktake, Mitigation		Biodiversity and Ecosystem Sustainability, Water Resources Management	Ecosystems	Climate-Ocean-Biodiversity Land-Food-Water-Biodiversity
GEO-CRADLE	SDGs 1, 2, 3, 7, 9, 11, 13, 15, 17	Adaptation, Cap Dev/Tech Transfer, Mitigation			Cross-cutting	Climate-Ocean-Biodiversity Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
GEO-GLOWS	SDG 6			Disaster Resilience, Energy and Mineral Resources Management, Food Security and Sustainable Agriculture, Public Health Surveillance, Water Resources Management	Water	Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
GOS4POPS	SDGs 3, 6			Public Health Surveillance, Sustainable Urban Development	Atmosphere	Climate-Health-Infrastructure
GSNL	SDG 11		Target F, G	Disaster Resilience	Disasters	Climate-Health-Infrastructure
GLUI	SDG 11	Adaptation, Mitigation		Biodiversity and Ecosystem Sustainability, Disaster Resilience, Public Health Surveillance, Sustainable Urban Development	Urban	Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
GWIS	SDGs 1, 3, 11, 13, 15, 17	Mitigation	Target G	Biodiversity and Ecosystem Sustainability, Disaster Resilience	Disasters	Climate-Ocean-Biodiversity Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity
HUMAN-PLANET	SDGs 11, 15	Loss & Damage	Target G	Disaster Resilience, Sustainable Urban Development	Urban	Water-Food-Energy Climate-Health-Infrastructure Land-Food-Water-Biodiversity

This table represents contributions of GEO Work Programme activities, in particular Flagships and Initiatives, to the Engagement Priorities, Societal Benefit Areas, how activities have been organized per Engagement Teams, which were established under the Programme Board in 2020, and includes a suggestion on how they could be arranged considering the four Nexuses that have been identified in view of the GEO Plenary in 2021.