



Digital Earth
AFRICA

Digital Earth Africa Governance Framework

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1 Introduction

The United Nations 2030 Agenda for Sustainable Development, as articulated in the Sustainable Development Goals (SDGs), offers new challenges and opportunities as a universal effort to address social, economic and environmental issues across all countries by 2030. With 17 goals, 169 targets and over 230 indicators, the agenda is ambitious, and requires new approaches for how data can be used across sectors of the community and at all levels to address national development priorities and sustainable development.

Within the context of the SDGs, a data revolution for sustainable development is allowing for the fusion of technologies from satellites to mobile phones, cloud computing and machine learning, to make available unprecedented volumes of data. However, despite these advances, many challenges remain including data availability and access, quality and usability, disaggregation and timeliness, capacity and data for decision-making. Countries across Africa, as in other parts of the world, face many of these challenges, especially as they apply to environmental and social data.

Africa is a massive continent with a rich and diverse environment, but one that is under constant threat facing new challenges from climate change and environmental degradation as a result of overexploitation of natural resources. Illegal mining is occurring in many countries and this is quickly becoming a public priority due to the consequences on land degradation, water quality and deforestation. From 1990 to 2010, deforestation in sub-Saharan Africa exceeded most parts of the world. Food security continues to be an issue with chronic undernourishment increasing to 23% of the population in sub-Saharan Africa. Compounding the situation is the lack of agricultural census and data, denying ministries of agriculture the basic information needed to forecast and increase food security. Access to improved sources of drinking water is another area of challenge for Africa.

Earth observation (EO) has vast potential to provide insights and information to address national development priorities and global and regional frameworks, including *Agenda 2063: The Africa We Want*. Unlocking this potential is now a reality, due to several trends: operational satellites are providing routine global coverage; free and open data policies remove legal and cost barriers to data access; analysis ready data (ARD) is removing pre-processing burdens from users; computing and storage costs are reducing and cloud architectures are emerging; and Open Data Cubes (ODC) that enable continental-scale analyses of complete time-series data are able to produce rich new information. The Africa Regional Data Cube (ARDC), launched in May 2018 and in many ways a precursor to Digital Earth Africa, is already making use of the ODC technology developed by Geoscience Australia in the first continental scale, operational service of EO decision-ready products. Now, Senegal, Ghana, Sierra Leone, Tanzania and Kenya are making positive strides on answering questions related to some of the pressing problems in their countries.

Digital Earth Africa (DE Africa) will provide a routine, reliable and operational service that will enable African nations to track changes across their countries and the continent in unprecedented detail, and to provide insights on a wide range of issues, including flooding, droughts, soil and coastal erosion, agriculture, forest cover, land use and land cover change, water availability and quality, and changes to human settlements.

DE Africa will leverage technology and services developed in Australia (implemented as Digital Earth Australia) to deliver a continental-scale platform and programme that democratises the capacity to process and analyse satellite data. Routine decision-ready products and services will be made available in a model analogous to the operation of a weather service. DE Africa will develop partnerships with other institutions to leverage capacity and expertise and to align and scale the programme as part of its operational model.

1.1 Document Purpose

This document outlines the governance framework for DE Africa, inclusive of the core functions of each group, relationships between groups, terms of reference, principles and process.

2 Governance Framework

2.1 Vision

Digital Earth Africa will provide a routine, reliable and operational service, using Earth observations to deliver decision-ready products enabling policy makers, scientists, the private sector and civil society to address social, environmental and economic changes on the continent and develop an ecosystem for innovation across sectors.

2.2 Mission

Digital Earth Africa (DE Africa) will process openly accessible and freely available data to produce decision-ready products. Working closely with the AfriGEO community, DE Africa will be responsive to the information needs, challenges and priorities of the African continent. DE Africa will leverage and build on existing capacity to enable the use of Earth observations to address key challenges across the continent.

2.3 Outcomes

DE Africa will be developed and operated to deliver important and ambitious outcomes:

1. Countries are empowered, with national data and information relating to challenges of land, water, the environment, resources, and human population.
2. Lives are improved, through access to information that empowers governments, individuals and communities to make informed decisions and choices.
3. Development activities are more effective, through access to and use of information that improves the understanding of issues and solutions. Continental assessments, reporting, and responses are advanced through access to continental scale data and information products relevant to Agenda 2063 and the 2030 Agenda for Sustainable Development.
4. Digital transformation is advanced, through industry uptake and innovation using products and services from DE Africa.
5. Economic development and job creation are increased, through access to data for commercial products and services development.

2.3.1 Modalities

To progress toward the Outcomes, DE Africa will:

Programme Operations

- Be established as an on-going, operational programme for the continent, responsive to needs, challenges and priorities across Africa.
- Be developed as a continental data-cube for Africa in an operational environment, using the Open Data Cube software leveraging Digital Earth Australia expertise to achieve early progress, making analysis-ready satellite images and decision-ready products reliable and accessible.
- Have an identifiable programme office, providing a focal point for development, operations and governance, and a point for convening stakeholders for meetings, workshops and training events; led by a core team and a Coordinator¹.

Partnerships

- Work with the African and international community of space agencies and governments to ensure that vital global observations continue, and that the data are analysis ready, rapidly available, and readily accessible.
- Align the work of DE Africa with other related programmes from African and international space agencies and related organisations (e.g. CEOS) that are developing new Earth observation methods and conducting capacity development activities, through to local on-ground activities that apply DE Africa products or capture 'in-situ' measurements.

¹ The DE Africa programme will be positioned within an existing Department within the Host Institution. Because this Department already has a Director, the lead position for DE Africa will be called Coordinator, which is still a Director level position. The Coordinator will have reporting lines to the Director but will also have autonomy to lead and direct the DE Africa Programme.

- Align activities with the GEO Work Programme, in conjunction with AfriGEO, the network of more than half of the countries in Africa working on Earth observations in GEO.

Capacity and Uptake

- Build on existing capacity and co-design with countries to ensure the sustained delivery of DE Africa, including national level use of the DE Africa infrastructure and uptake of data products.
- Develop an iterative and adaptive engagement process with partners to ensure user needs are met and incorporated into the DE Africa work plan.
- Document the benefits of DE Africa, building a growing set of examples of positive impacts across sectors and spatial scales.

Communications

- Establish a sustained communications framework, providing outreach and information to users across sectors.
- Develop an outreach and engagement plan that builds high-level political buy-in for DE Africa at the national and regional levels.

2.4 Guiding Principles

The governance of DE Africa will be guided by several key principles.

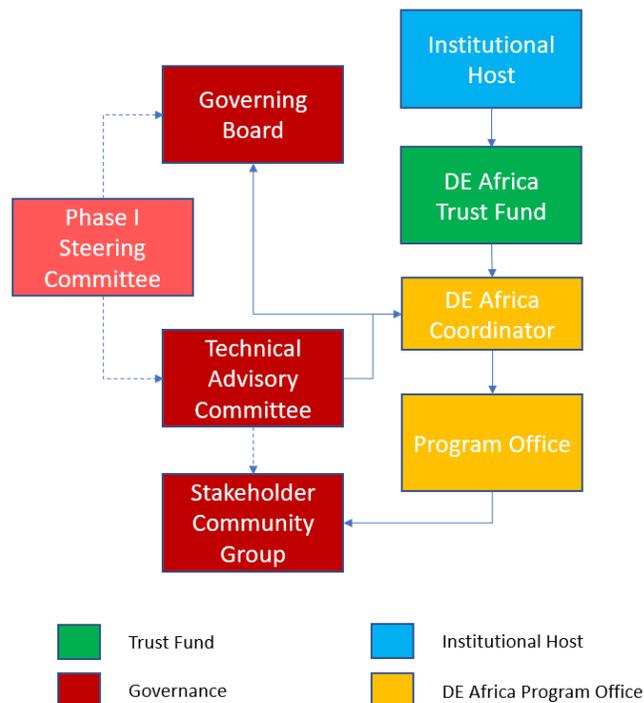
1. *Accountability and transparency.* The decision-making process of the governance framework should be accountable and transparent to the broader DE Africa community.
2. *Continental-scale data, products and operational services.* DE Africa will provide an operational service delivering data and products available for the entire continent.
3. *Responsive to African priorities.* DE Africa will be responsive to the needs, challenges and priorities across countries while leveraging and building on existing capacity to ensure uptake of data products into decision-making processes.
4. *Foster national and regional collaboration.* DE Africa will align to existing regional mechanisms and drive uptake at the national levels to address policy challenges at both levels.
5. *Open and free data.* DE Africa will be a public good providing free and open data and products to all its users.
6. *Sustainability.* DE Africa will develop a value proposition that supports a sustainable business and funding model by engaging countries, thus ensuring delivery of DE Africa products and services in the long-term.
7. *Diversity and inclusion.* DE Africa will seek to be an exemplar of diversity and inclusiveness. The governance framework will be mindful particularly of gender and geographic diversity in its makeup at all levels.

8. *Incorporate multi-sector perspectives to maximise benefits.* The Governance of DE Africa will include representation from across sectors, recognising that DE Africa will deliver the greatest possible value through being useful to a broad ecosystem of information users. Representation is sought from government, the private sector, civil society, academia, international organisations, foundations and others.
9. *Incorporate perspectives from across data communities.* DE Africa products will provide benefit across data communities, especially as the ecosystem develops and Earth observation data is combined with other data sources. Therefore, representation will be valued from a range of data communities (e.g. national statistics, telco data, open data, other big data, citizen generated data).
10. *Incorporate domain expertise.* DE Africa will provide data products useful for agriculture and food security, water access and quality, deforestation, mining, disaster response, climate change, and more. Expertise from these domains will be needed to validate approaches and outcomes, and therefore organisations with specific domain expertise aligned to the vision and work programme for DE Africa may be included in DE Africa governance bodies.
11. *Agile, nimble and action oriented.* The governance of DE Africa recognises that the intent of DE Africa is to actively deliver, adapt and iterate as needed, and to develop existing capacity to make a real-world difference. The governance must not become overly bureaucratic or top-down such that it stifles work and action.
12. *Interoperability.* DE Africa will be based on an open data infrastructure and FAIR² principles to ensure DE Africa can connect with other platforms and infrastructures to share data, products and algorithms.
13. *Privacy and Integrity.* DE Africa will ensure that privacy concerns of personal data and those data with national and regional security concerns are handled with integrity and confidentiality according to internationally accepted standards and protocols.

² Findable, Accessible, Interoperable, Reusable (FAIR). See <https://www.go-fair.org/fair-principles/>

2.5 Structure

The Governance Framework consists of a Governing Board, a Technical Advisory Committee and a Stakeholder Community Group and several other entities. The following provides an overall structure of the Governance Framework inclusive of the relationship between each of these groups:



The relationship between each category is described as follows:

- **Governance:** Consists of the Governing Board, Technical Advisory Committee (TAC) and the Stakeholder Community Group (SCG). The Governing Board is at the highest level. The Governing Board and the TAC provide advisory support to the Coordinator of the DE Africa Programme Office. The SCG is managed by the Programme Office and is a group that the TAC can leverage for working groups or otherwise as needs develop in the future and as the SCG matures into a Community of Practice.
- **Institutional Host:** The institutional host for DE Africa will provide fiduciary and administrative support to the programme including management of the DE Africa Trust Fund and hosting the DE Africa Programme Office core staff.
- **DE Africa Programme Office:** Consists of the Coordinator for DE Africa along with core staff needed to run and manage the DE Africa programme. The Coordinator is

accountable to the Governing Board for the delivery of the work programme. The Coordinator takes guidance from the TAC and gives direction to the Programme Office.

- **DE Africa Trust Fund:** This Trust Fund will become a mechanism to pool funds from different funding organisations for operational support of the DE Africa Programme. It will be administered by the Institutional Host and decisions made against the available funds will be based on the DE Africa work programme and approved activities. While the Governing Board will not make decisions on how the Trust Fund is utilised, it will provide guidance and direction to the DE Africa Coordinator and Programme Office³.

The Steering Committee from Phase I will be used for guidance until this governance framework is implemented. It is expected that some membership from the Phase I Steering Committee will transition into the Governing Board or TAC. During the establishment phase, and until such time as the inaugural Coordinator is appointed, the role of the Coordinator will be filled by the Managing Director of the Establishment Team.

2.6 Governing Board

Overview

The Governing Board will provide strategic guidance, oversight and accountability to ensure successful achievement of the mission and vision of DE Africa including policy guidance, alignment and prioritisation, and uptake and use of data products at the national and other levels. Board membership should reflect diversity and expertise consistent with the mission of DE Africa, and include members at the highest levels within each organisation when appropriate. Board members shall align to and provide relevant expertise to the mission and vision of DE Africa, and bring their collective experience, knowledge and networks to provide strategic guidance to benefit DE Africa.

Size and Cadence

Board membership will be capped at 15 members. Board members will meet either virtually or in-person twice each year. Beyond these meetings, members may be asked individually to provide support to the DE Africa Coordinator and Programme Office according to the Terms of Reference.

Term

With exception of the host institution, Board membership at inception will be on a 3 year-term. Thereafter, the term will change to 2 years. This is to ensure the initial Board members can provide input to DE Africa as the programme matures through its establishment phase. The

³ For the first round of funding being made available by the Australian Department of Foreign Affairs and Trade (DFAT) and the Helmsley Charitable Trust, Geoscience Australia as the prime recipients will manage these funds. Geoscience Australia will disburse and distribute funds into the Trust Fund based on the work programme and agreed upon activities with the expectation that other management scenarios will take place as new funders come onboard.

Africa Development Bank, Africa Union Commission, GEO Secretariat, UNECA and the Regional Economic Communities of the African Union (RECs) will hold permanent positions on the Governing Board. For all other organisations, membership will be rotating, and in order to maintain continuity, these organisations may renew their membership for a 2 year term based on approval from the Chairs. After this point, new organisations will be selected that will rotate every 2 years. Members may also end their membership at any time with 3 months advanced notice. For all organisations included in the Governing Board, the Chairs also have the power to open a vote among Governing Board members to replace a member due to inactivity or other indiscretions requiring such an action.

Membership

The DE Africa Establishment Team, having regard to the governance principles including gender and geographic diversity, will present an initial set of recommended institutions for Board membership to the Phase I Steering Committee. The Phase I Steering Committee will approve the list of nominations and provide support as needed for any recruitment needed. Any changes or new memberships will be managed by the co-chairs and the DE Africa Programme Office. The DEA Coordinator will be an ex-officio member of the Governing Board.

2.6.1 Terms of Reference

Board members will have the following responsibilities:

- Approve the overall strategy, investment decisions and annual work programme.
- Provide guidance on policy implications from alignment to influence based on DE Africa products and outcomes.
- Monitor achievements and progress.
- Provide contact persons to help with high-level political engagements.
- Connect DE Africa programme with country needs, challenges and resources.
- Support resource mobilisation through contacts and potential sources of funding.
- Support broader outreach and communications using the DE Africa communications toolkit.
- Ensure DE Africa is delivering impact and capacity in line with the vision, mission and goals.
- Approve the Governance Framework, its annual review and any future amendments including a review of hosting arrangements.
- Nominate and recruit new Board members as needed.

2.6.2 Board Chairs

Two Co-chairs will be selected for the Governing Board based on input and guidance from the Phase I Steering Committee. The DE Africa Establishment Team will support a Secretary function that the DE Africa Programme Office will manage in the long-term.

Core responsibilities of the Chairs include:

- Work in close collaboration with the Coordinator of the DE Africa Programme Office and provide guidance, support and advice as needed.
- Convene and chair each Board meeting.
- Manage and facilitate Board discussions and bring discussion topics to a conclusion through inclusion of opinions from all Board members.
- Consult with the Co-Chairs of the Technical Advisory Committee to ensure TAC recommendations are factored into the Board agenda.
- Oversee the membership process including renewals and cycle turnover.
- Ensure Board members are participating to the extent agreed upon and mitigate any conflicts or disagreements.

2.7 Technical Advisory Committee

Overview

The Technical Advisory Committee (TAC) is selected to be able to deliver on the Terms of Reference below. It is inclusive of respected subject-matter-experts who can provide rigorous and practical guidance on the overall technical programme for DE Africa. This may include the latest technological trends and emerging issues on topics related to the use of geospatial and earth observation data, big data, data science, citizen generated data, national statistics, data governance and privacy, interoperability and other topics of a similar nature as identified. The TAC must also include domain experts and practitioners who can provide guidance on how DE Africa, for example, can be applied to agriculture, climate change, poverty, the SDGs, etc. and the most effective ways to engage with down-stream communities to deliver maximum impact. The TAC will also ensure alignment with other programmes and initiatives across Africa that can benefit from DE Africa (or vice versa) such as AfriGEO and GMES Africa. This will especially be important for country engagement and capacity building. As a result, the TAC will work closely with the Coordinator and Programme Office to ensure these trends, insights and alignment opportunities are factored into the work programme.

Size and Cadence

TAC membership will be capped at 20 members. TAC members will meet either virtually or in-person twice per year. Beyond these formal meetings, members may be asked to provide support individually to the Coordinator and Programme Office based on needs in line with the Terms of Reference.

Term

TAC membership at inception will be on a 3-year term. Thereafter, the term will change to 2 years. This is to ensure the initial TAC members can provide input to DE Africa as the programme matures through its establishment phase. TAC membership will be rotating, and in order to maintain continuity, 8 of the original TAC members will be asked (by the Chair) to

renew their membership for a 2-year term. After this point, all TAC members may renew their membership to a new 2-year term only once. Members may also end their membership at any time based on adequate notification.

Member Selection

Based on the principles and terms of reference, including gender and geographic diversity, the DE Africa Establishment Team will present an initial set of recommended institutions and individuals for TAC membership to the Phase I Steering Committee. The Phase I Steering Committee will approve the list of nominations and provide support as needed for any recruitment needed. Any changes or new memberships will be managed by the TAC co-chairs and the DE Africa Programme Office. Membership will bring a high level of expertise and executive representation from organisations that are direct stakeholders in DE Africa.

2.7.1 Terms of Reference

TAC members will have the following responsibilities:

- Expert Advice and Guidance
 - The TAC will provide expert advice and guidance to the Programme Office on issues related to: technical and scientific directions; stakeholder engagement at the international, regional, country levels; cross-sectoral engagement, including government, commercial, and community; capacity building, and; the latest trends, issues and research that can further benefit DE Africa's technical and capacity building programmes.
- Products Roadmap
 - The TAC will provide input on the work programme and will have particular responsibility to guide the development of products roadmap, a public-facing document that will lay out the agreed products that DE Africa will develop and produce on an operational basis.
- Alignment opportunities
 - The TAC will also support DE Africa through identifying and creating opportunities for alignment, and growth, and will provide guidance on alignment opportunities for programmes, initiatives and organisations where mutual benefit can be gained in relation to the DE Africa mission and vision.
- Engagement with Users
 - The TAC will provide the Programme with guidance and support to achieve deep engagement with key users in order to deliver with impact. This engagement is the critical link between information products that DE Africa will produce, and

their uptake and use in decision making, across sectors, and will ensure that DE Africa is delivering impact and capacity in line with the vision, mission and goals.

- Cross-community engagement
 - The TAC will seek to provide cross-community engagement, *in particular* linking DE Africa to user communities beyond the familiar Earth observation, Geospatial and Statistics communities.
- Programmatic support
 - Leverage the Stakeholder Community Group when necessary as special topics arise needing further stakeholder input in the form of working groups or task teams.
 - Support resource mobilisation.
 - Support communications and outreach.
 - Nominate and recruit new TAC members as needed.

2.7.2 TAC Co-Chairs

For the first three years of the programme, one of the Co-Chairs of the TAC will be Geoscience Australia. This is to ensure the technical programme aligns with the broader vision for DE Africa and those resources being made available from Australia. After this 3-year period, the new Chair will be nominated through a voting process by TAC members. Core responsibilities of the Co-Chairs include:

- Convene and chair each TAC meeting working with the Programme Office to develop and distribute the agenda and necessary background documents.
- Manage and facilitate TAC discussions and bring discussion topics to a conclusion through inclusion of opinions from all TAC members.
- Oversee the membership process including renewals and cycle turnover.
- Ensure TAC members are participating to the extent agreed upon and mitigate any conflicts or disagreements.
- Based on TAC member approval, extend invites as necessary to observers to participate in TAC meetings.

2.8 Programme Office

The Programme Office will provide the operational capability for DE Africa under the leadership of the Coordinator. It may include 30 or more staff members over the next 3 years located in Addis Ababa and other locations across Africa. A range of mechanisms, such as secondments, contracting and hiring staff through the host institution HR processes may be used to staff needed positions.

The DE Africa Coordinator and Programme Office will carry out the work programme across all key functions, including political and country engagement, communications and outreach, technical development and maintaining the data infrastructure, partnerships and capacity building. The DE Africa Programme Office will also provide secretariat functions for the governing bodies including the stakeholder community group.

2.8.1 Terms of Reference

The DE Africa Programme Office provides the operational capability for DE Africa. The Terms of Reference will be identified by the work programme and related staffing positions.

2.9 Stakeholder Community Group

The Stakeholder Community Group (SCG) will provide a voice to a wider range of organisations than those in the immediate governance structure, providing DE Africa with the breadth of perspective and engagement that will be necessary to achieve impact and growth to a sustainable service. The SCG will provide increased diversity of representation, across sectors, domains, gender, geography and data communities.

The SCG will provide a two-way communication path, allowing the Programme Office to reach out to a wider community to provide information and to gather views and input. This may include Programme Office updates, demonstrations and discussions of key topics or new innovations and the gathering of feedback on updates and progress.

The SCG will be open to representation from all organisations whose operations are aligned with the DE Africa mission and vision. The SCG will include a breadth of expertise useful to the outcomes of DE Africa and may grow to become a Community of Practice. The TAC, in partnership with the Programme Office, may also leverage the SCG, for example to develop working groups or task teams, as needed.

2.9.1 Terms of Reference

- The SCG will support the mission and vision of DE Africa by allowing rich interactions between DE Africa and its wider stakeholder base to create awareness, to share information, and to identify and leverage opportunities for all parties.
- Membership of the SCG is open to organisations and individuals whose work and interests are aligned to benefiting the mission and vision of DE Africa.
- Participating individuals may appear as representatives of organisations or as individuals (e.g. university academics). However, for each member this must be explicit.
- The SCG will:
 - Stay engaged with updates and related materials distributed by the Programme Office.

- Participate in scheduled teleconferences and webinars when possible.
- Respond when possible to requests and invitations from the Programme Office when possible.
- Provide input on the programme for the DE Africa annual meeting.