



# Digital Earth Africa

## Governing Framework

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## VERSION HISTORY

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1.0	July 2019	Governance Framework v1 endorsed by the TAC	
2.1	28 June 2021	Draft for Board discussion	
2.2	July 2021	Final Draft for Board Adoption	

## AMENDMENT HISTORY

ISSUE	LOCATION	TYPE	DESCRIPTION	DATE	AUTHOR
2.1		Content	Integration of the Distributed Operational Model Framework, including reference to a Program Management Office and implementing Partner organisations	16 June 2021	Lewis
		Content	Separation of GB and TAC ToRs into separate documents	28 June 2021	Lewis/Reddy

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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, made use of the ODC technology developed by Geoscience Australia in the first continental scale, operational service of EO decision-ready products for Australia. Senegal, Ghana, Sierra Leone, Tanzania and Kenya made 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 leverages Australian experience and international partnerships to deliver a continental-scale platform and Program that democratizes the capacity to process and analyse satellite data. Decision-ready products and services will be routinely available in a model analogous to the operation of a weather service. DE Africa works in partnership with other institutions to leverage capacity and expertise and to align and scale the Program as part of its operational model.

## 1.1 Document Purpose

This document outlines the DE Africa governing framework. It includes the core functions of governance groups, relationships between groups, terms of reference, principles and processes. This document also outlines the accountabilities and responsibilities of key roles and groups.

The governance framework is critical to the establishment of DE Africa. On the strong advice of the Interim Phase-I Steering Committee, the governance framework is designed with the end-state in mind (that is, DE Africa as an established, operational capability) rather than to support the establishment process itself. DE Africa is evolving from an Establishment Phase, where there are commitments to foundation funders and others, toward an end state of full independence. In that end-state the elements of the governance framework take on full responsibility to shape and sustain the DE Africa infrastructure and services. The ultimate form of the end state might, for example, be its own internationally recognised and registered non-profit organization (NGO).

Further details for the key governance groups (Governing Board, Technical Advisory Committee, Stakeholder Community Group, Program Management Office, Implementing Partners, Funding Host and Independent Assurance) are included in their individual Terms of Reference which are attached as appendices to this document.

## 2 Governing 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 is being 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:

#### Program Operations

- Be established as an on-going, operational Program 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 Program Management Office (PMO), providing a focal point for development, operations and governance, and a point for convening stakeholders for meetings, workshops and training events; resourced by a core team and led by a Director.

### 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.
- Leverage capacity and expertise across African-based organizations and institutions to support implementation and operations of DE Africa.
- Align the work of DE Africa with other related Programs from African and international space agencies and related organizations (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.
- Align activities with the GEO Work Program, 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 organizations, foundations and others.
9. **Incorporate perspectives from across data communities.** DE Africa products will provide benefits 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 organizations with specific domain expertise aligned to the vision and work Program 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.

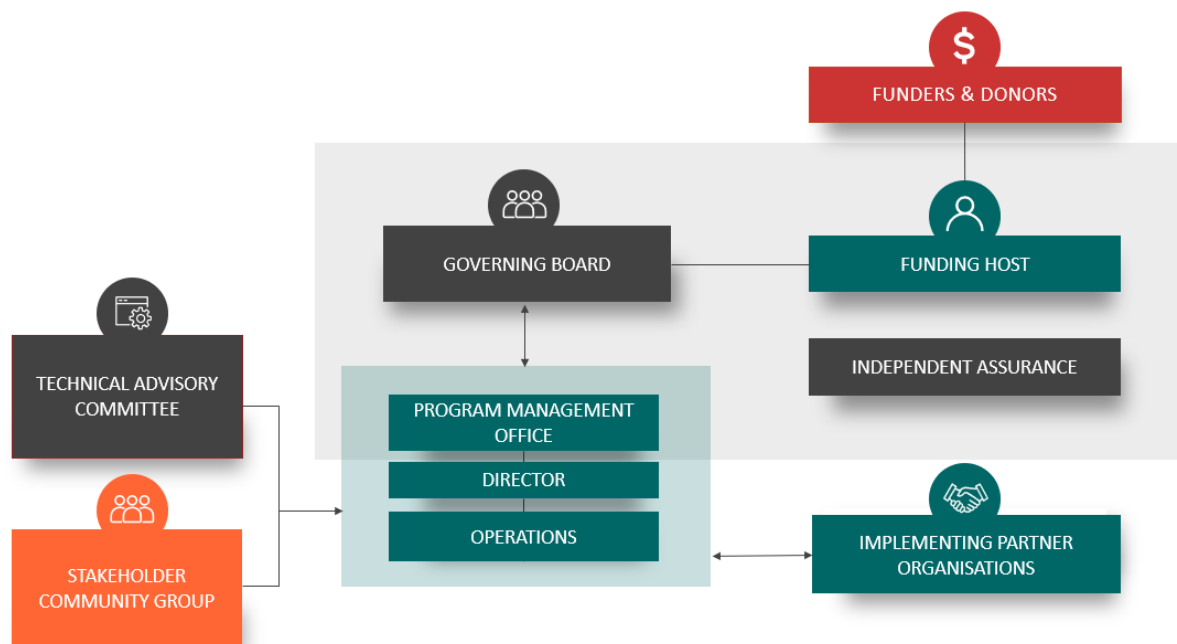


12. **Interoperability.** DE Africa will be based on an open data infrastructure and FAIR<sup>1</sup> principles to ensure DE Africa can connect with other platforms and infrastructures to share data, products and algorithms.
13. **Privacy and Integrity.** DE Africa will ensure that privacy concerns 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.

## 2.5 Structure

The Governing Framework provides the system by which the DE Africa Program is controlled and operates, and the mechanisms by which it, and its people, are held to account. Strategic directions, guidance, ethics, risk management, compliance and administration are all elements of governance. The main structures of the Governing Framework are illustrated and described below.

The DE Africa Program of work is implemented using a distributed operational model, which distributes ownership and leverages and increases the capacity of Implementing Partner institutions across Africa.



<sup>1</sup> Findable, Accessible, Interoperable, Reusable (FAIR). See <https://www.go-fair.org/fair-principles/>

The functions of and the relationships between each of these groups are:

- **Funders and Donors:** provide funds (both government and other) to the Funding Host. Funds can be provided as grants and / or donations from countries, governments, NGO's, partners, private entities, educational institutions, and the general public.
- **Funding Host (FH):** is a trusted internationally recognised institution/agency that receives and holds in trust all funds received from Funders and Donors. The Funding Host releases the funds to the Program Management Office on approval of the Governing Board. The Funding Host provides regular financial reports to the Funders and Donors. The FH may be required until such time that DE Africa becomes a fully independent entity.
- **Governing Board (Board):** is ultimately responsible for the successful implementation of DE Africa. The Board is accountable for the funds allocated to the Program and also sets and approves the strategy, champions the guiding principles, and endorses the priorities. The Board approves annual work plans within the program which releases the necessary funds from the Funding Host.
- **Technical Advisory Committee (TAC):** provides the Program Management Office ideas, advice, expertise and endorsement for developing the work packages using the strategy, guiding principles, and priorities set by the Governing Board.
- **Program Management Office (PMO):** is the executive leadership of DE Africa, headed by the Director. The PMO develops work plans for approval of the Governing Board, which enables funds to be released from the Funding Host to the PMO. The work plan proposals confirm their alignment to the DE Africa strategy and include the: scope; budget; delivery schedule; deliverables and benefits planned to be achieved along with risks; resourcing; stakeholders and partners. The PMO is responsible for delivering the work plan approved by the Governing Board. The TAC endorses the work plan prior to the PMO submitting for approval by the Governing Board.
- **Implementing Partners:** provide in-kind resources to the distributed operational model where staff, contractors and secondments provide support to the DE Africa Program. Some implementing Partners may also provide funds to support the Program's activities. Implementing Partner Organisations are represented on the TAC.
- **The Stakeholder Community Group (SCG):** connects DE Africa to a wider range of individuals and organizations 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.
- **Independent Assurance:** is a recognised independent assurance / audit entity that provides annual reviews to confirm funds are being spent effectively and to confirm the work packages are delivering the benefits they were funded for. The assurance reports are made available within the DE Africa Program and to the Funders and Donors which should then assist with the Program to gain more funding.

## 2.6 Governing Board

The Governing Board holds ultimate governance responsibility for the success of DE Africa. 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 prioritization. The Governing Board is responsible for country-level buy-in and long term sustainability of the Program beyond the Establishment Phase. Governing Board membership will reflect diversity and expertise consistent with the mission of DE Africa and will include members at the highest levels within each organization when appropriate. Governing 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.

The Governing Board Terms Of Reference are included in Appendix 1.

## 2.7 Technical Advisory Committee

The Technical Advisory Committee (TAC) is inclusive of respected subject-matter-experts who can provide rigorous and practical guidance on the overall technical program 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 Sustainable Development Goals (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 programs 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 PMO Director and Program Management Office to ensure these trends, insights and alignment opportunities are factored into the work program. The TAC will review and endorse the work plans developed by the PMO which are submitted to the Governing Board for approval and release of funds.

The Technical Advisory Committee Terms Of Reference are included on Appendix 2.

## 2.8 Program Management Office

The Program Management Office will provide the operational capability for DE Africa under the leadership of the Director. It will include core staff members required for the leadership and coordination of the Program and be positioned within a DE Africa Implementing Partner organization. A distributed operational model draws on staff, contractors and secondments to provide support to the DE Africa Program from across implementing partners in Africa. The Program Management Office acts as the central leadership, coordinator and project delivery office. The Program Management Office will be the hub focused on delivering the work plan endorsed by the TAC and approved by the Governing Board.

Key roles within the Program Management Office are:

- **Director:** Reports to the Governing Board and has delegated authority to lead the PMO and deliver the approved work plan, according to the priorities and strategies set by the Governing Board. The Director is responsible for ensuring the work packages within the Program meet their objectives and deliver the expected outcomes.

The Director works closely with the Governing Board and the TAC to ensure effective engagement and communications with the PMO, and manages key stakeholder relationships at the executive level, in particular with Implementing Partners. The Director is accountable for the funds spent by the PMO and delivering the Approved Work Plan within the specified budget.

The Director is responsible for leading the PMO and PMO staff performing the Services, and proactively engaging with the Governing Board, the TAC, Implementing Partners, relevant stakeholders supporting the DE Africa such as research institutions, funders, donors and individuals involved in aligned programs of work, to facilitate the delivery of DE Africa.

- **Head of Operations:** Reports to the Director and manages the PMO resources to ensure the work packages within the Program are delivered to the agreed time, cost and benefits. Manages the day to day operations of the PMO.

Head of Operations works closely with the TAC and Implementing Partners to ensure effective engagement and communications with the PMO and its resources. Coordinates resources across all organisations involved in the delivery of DE Africa. Manages key stakeholder relationships at the appropriate level.

- **PMO Resources:** Project Managers, Project Controls, and Administration resources that deliver the work packages. PMO resources engage with the TAC and stakeholders as required to develop and deliver specific work packages.

The Program Management Office will develop and deliver the work packages within the Program across all key functions, including political and country engagement, communications and outreach, technical development and maintaining the data infrastructure, partnerships and capacity development. The Program Management Office will also provide secretariat functions for the governing bodies including the Stakeholder Community Group.

## 2.9 Implementing Partners

Implementing Partners will provide in kind resources to the distributed operational model where staff, contractors and secondments provide support to the DE Africa Program. Implementing Partner institutions will have mandates, objectives, capabilities and resources that naturally align to DE Africa, giving them a stake in the outcomes of the Program and ensuring that the relationship is a genuine partnership, with investment from both sides.

Implementing Partners institutions may host a range of activities or functions for the DE Africa Program, which include:

- **Platform Operations:** will specifically focus on the management and operations of the core DE Africa data infrastructure. This will support and maintain the cloud-based infrastructure that makes data and services available to all the users and ensure these data and services are updated based on the defined update frequency for each input dataset or service. It will also be responsible for identifying new input and foundational datasets that will be made freely accessible to all users. Platform operations requires deep skills in software engineering and EO data (DE Africa does not operate a physical infrastructure). The software engineering functions of the Platform will connect with peer-teams supporting other large-area data cubes, including with Digital Earth Australia.
- **User Engagement:** Partner institutions will support engagement with users across countries to increase the uptake of DE Africa data and services. This will include identifying needs, priorities and issues and developing new use cases that can be taken up by the DE Africa Applications team.
- **Science and Applications:** As new use cases and needs are identified, partner institutions will support the development of new services to address these needs. This can include new DE Africa data layers and services, visualizations or applications to deliver data and services in new and innovative ways. Applications development will draw on geographic, Earth observation and thematic knowledge and experience, and will utilise the DE Africa Sandbox environment to invent and adapt fit for purpose algorithms to produce information that supports decisions.
- **Communications and Outreach:** Partner institutions will support the implementation of the Digital Earth Africa Communication Strategy. This can include building in-country stakeholder support, ensuring users have the information they need to access and use DE Africa data and products in ways that address their country or organisation needs and growing awareness of how and why spatial data can be used to gain insights into land use and change, water availability, human settlement, coastal erosion, soils, forests and agriculture.

Partner institutions will be involved in delivery of capacity development for the program and will engage with the DE Africa team on various technical activities, for example data validation, that may be required for various products and services.

Partners will also support coordination at the country-level. For example, supporting the connection of DE Africa data and services to decision-making and action, as well as supporting the development and communication of case studies that demonstrate the impact and potential value of DE Africa.

Implementing Partner organisations will be represented on the TAC.

## 2.10 Independent Assurance

Independent Assurance is provided by a third party that is separate from the entire DE Africa Program. It is important that Independent Assurance has no financial or direct benefits in the Program and is independent of all partners, countries and members of the Program. The role of Independent Assurance is to provide regular reviews and reports on the progress of the DE Africa Program and to provide assurance to Funders and Donors that the funds provided to the Program are being appropriately used to deliver the Program benefits. This should also provide confidence to current and future Funders and Donors to contribute more funds to the Program and to assist it to be self-sustaining.

The scope for Independent Assurance would include reviews of the Funding Host, the Governance Board and the Program Management Office. The reviews would cover work package development and delivery, accuracy of reporting, benefits management, outcomes delivered, financial accounts and management.

There are several benefits that are achieved from Independent Assurance:

- It ensures funds are used wisely and invested appropriately.
- It ensures the benefits and deliverables promised by the Program are achieved.
- It provides Funders and Donors feedback and confidence that the funds provided have been utilised as agreed. This also provides reassurance for Funders and Donors to continue funding the Program.
- It can encourage additional Funders and Donors to provide funds to the Program as the Program can demonstrate a high level of governance and independent assurance.
- Lessons learned from the assurance reviews can assist the Program to continually improve and demonstrate best practices.

## 2.11 Stakeholder Community Group

The Stakeholder Community Group (SCG) will provide a voice to a wider range of organizations 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 Project Management Office to reach out to a wider community to provide information and to gather views and input. This may include updates on work packages, 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 Program Management Office, in partnership with the TAC, may also leverage the SCG, for example to develop working groups or task teams, as needed.