

**EUROPEAN SPACE AGENCY CONTRACT
REPORT**

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WASCIA – WATER STRESS AND CLIMATE INDICES FOR AFRICA

Policy Traceability Matrix Analysis

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1 INTRODUCTION

1.1 *PURPOSE OF DOCUMENT*

This document is part of the D4 deliverable for the ESA Water Stress and Climate Indices for Africa (**WaSCIA**) project. Principally, it contains the Policy Traceability Matrix (**PTM**), which has been created from selecting key policy requirements from a number policy and related documents. The table offers suggestions for how these policy requirements can be met through the aims of the WaSCIA project and relates these requirements to those suggested by our target users.

It also includes brief summaries of these policy documents and hyperlinks to copies and finishes with a summary of our findings.

1.2 *CONTENTS OF DOCUMENT*

Following this introductory section, the document layout is as follows:

Section 2 presents the Policy Review. This is partitioned as:

Section 2.1 contains a summary of the policy documents that had suitable Policy Requirements

Section 2.2 contains the Policy Traceability Matrix (PTM)

Section 3 presents the Conclusions

1.3 REFERENCES

1.3.1 Applicable Documents

The following applicable documents are those referenced in the Contract or approved by the Agency. They are referenced in this document in the form [AD n.]:

AD	Title	Version / Date
AD 1.	Statement of Work - ESA Express Procurement [Plus] - [EXPRO+] - EO AFRICA - NATIONAL INCUBATORS EXPRO+	1.0 26/10/2021
AD 2.	KPT91865-AO11039-Proposal-EOAFRICA-R1r0.pdf	1.0 18/02/2022
AD 3.	WASCIA-KO-Minutes_1.0.pdf	1.0 07/10/2022

1.3.2 Reference Documents

The following reference documents are those referenced within this document. They are referenced in this document in the form [RD n.]. They are not applicable documents.

RD	Title / source	Version / Date
RD 1.	WaSCIA.TN.007 Selected African end-user organisations characterisation report and Value Proposition analysis (D2)	1.0 / 15/02/2023
RD 2.	Policy on Water, African Development Bank Group.	2021
RD 3.	Global Water Partnership: Mobilising for a water secure world. Strategy 2020-2025. GWP	2019
RD 4.	Africa water vision for 2025: equitable and sustainable use of water for socioeconomic development. UN Water/Africa	2000
RD 5.	African Union (AU) Agenda 2063 Framework Document "The Africa We Want". African Union	2013
RD 6.	African Union (AU) Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024). African Union	2014
RD 7.	The Global Risks Report 2020. World Economic Forum	2019
RD 8.	African Union (AU) African Space Strategy: Towards social, political and economic integration. African Union	2017
RD 9.	Transforming our world: the 2030 Agenda for Sustainable Development. United Nations	2015
RD 10.	GMES and Africa Corporate Brochure. African Union	-
RD 11.	GMES and Africa Training Strategy. African Union	2018

RD	Title / source	Version / Date
RD 12	GMES and African Communication and Engagement Strategy. African Union	2018

1.4 ACRONYMS AND TERMS

The following acronyms and abbreviations have been used in this document.

Acronym	Definition
AfDB	African Development Bank
AU	African Union
GMES	Global Monitoring for Environment and Security
GWP	Global Water Partnership
ID	Identifier
IWRM	Integrated Water Resources Management
OR	Operational Requirements
PTM	Policy Traceability Matrix
SR	System Requirements
UR	User Requirements
WaSCIA	Water Stress and Climate Indices for Africa

2 POLICY REVIEW

2.1 POLICY DOCUMENTS

The documents that have suitable requirements that could be utilised in the PTM are briefly summarised below. This is not an exhaustive list of all the documents that were reviewed but are the documents that garnered the most relevant results.

[RD 2] African Development Bank – Policy on Water

The African Development Bank (**AfDB**) Group was setup to aid member countries in their economic and social development. The New Policy on Water provides a framework for how the AfDB can support the water sector. The Policy on Water has four key areas of focus:

1. Water security attainment at household through to national level, including the investment in knowledge to achieve this
2. Strengthened Integrated Water Resources Management
3. Water services access promotion
4. Management of transboundary water resources

Link: <https://www.afdb.org/en/documents/policy-water> (last accessed 15.02.2023)

[RD 3] Global Water Partnership: Mobilising for a water secure world. Strategy 2020-2025

The Global Water Partnership (**GWP**) is an intergovernmental and multi-stakeholder group that works alongside countries to help manage water resources. Their mantra is to be the 'voices of water', through their extensive network of partner organisations, Country Water Partnerships and Regional Water Partnerships, so that they can influence development priorities from a local level right through to a global level. Their 2020-2025 strategy focusses on three key areas:

1. Water solutions for the Sustainable Development Goals
2. Climate resilience through water
3. Transboundary water cooperation

Link: <https://www.gwp.org/globalassets/global/about-gwp/strategic-documents/gwp-strategy-2020-2025.pdf> (last accessed 15.02.2023)

[RD 4] Africa water vision for 2025: equitable and sustainable use of water for socioeconomic development

A framework designed around African water resources and their key-role in meeting social and economic development goals. The framework is based around four main pillars:

1. Strengthening governance of water resources
2. Improving water wisdom
3. Meeting urgent water needs
4. Strengthening the financial base for the desired water future

These are in response to threats such as the increasing water scarcity, the amount of water-basin that cross boundaries, the extreme variability in climate and rainfall across the continent combined with climate change, plus human threats such as investment, pollution, and governance.

Link: <https://www.ircwash.org/sites/default/files/ECA-2000-Africa.pdf> (last accessed 15.02.2023)

[RD 5] African Union (AU) Agenda 2063 Framework Document “The Africa We Want”

Is Africa’s ‘blueprint’ and ‘masterplan’ to transform it into a future global powerhouse. It is a framework for the whole continent, with various goals to be completed by 2063 based around inclusive and sustainable development, unitedness, self-determination, freedom, progress and collective prosperity.

Link: https://au.int/Agenda2063/popular_version (last accessed 15.02.2023)

[RD 6] African Union (AU) Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024)

Developed at the same time as the AU Agenda 2063, the STISA-2024 is the first of ten-year incremental phasing strategies that responds to the science, technology and innovation demands across various sectors including water, environment and agriculture. The document details high-level goals to addressing the technological divide in Africa; encouraging African countries to embrace what it calls the ‘ongoing Technological Revolution’.

Link: <https://au.int/en/documents/20200625/science-technology-and-innovation-strategy-africa-2024> (last accessed 15.02.2023)

[RD 7] The Global Risks Report 2020

The World Economics Forum 15th edition of the Global Risks Report has a clear narrative for the need of a multistakeholder approach to mitigating risk globally in fields such as health, digital fragmentation, biodiversity, climate and economic and social issues.

In technology, a widening ‘digital divide’ risks leaving behind areas such as Africa. The report calls it a vicious cycle where increasing wealth gaps and brain drain, means that critical investment opportunities are missed.

Link: https://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf (last accessed 15.02.2023)

[RD 8] African Union (AU) African Space Strategy: Towards social, political and economic integration

A specific space strategy for Africa, partly in response to the AU Agenda 2063 and in contribution to the STISA-2024. This document addresses how space can assist in Africa meeting its economic, political, environmental and social challenges through Earth observations, navigation and positioning applications, satellite communication applications, and space science and astronomy. The strategy provides the key requirements and principles for meeting the African Space Policy, with expected outcomes for the next ten-years (document released in 2017).

Link: https://au.int/sites/default/files/newsevents/workingdocuments/33178-wd-african_space_strategy_-_st20445_e_original.pdf (last accessed 15.02.2023)

[RD 9] Transforming our world: the 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development was the result of the United Nations Sustainable Development Summit of 2015. 17 Sustainable Development Goals and 169 targets were agreed. Through a global partnership the broad aims of the Agenda were to bring an end to all poverty and hunger in the world; to protect the planet through sustainable practices, particularly with climate change; to ensure people have prosperous lives in harmony with nature; and for a peaceful society free of violence.

Link: <https://sdgs.un.org/2030agenda> (last accessed 15.02.2023)

Global Monitoring for Environment and Security (GMES) & Africa

The Global Monitoring for Environment and Security (GMES) was the precursor name of the Copernicus Earth observation programme. The GMES & Africa programme was initiated with the aim of “promoting the development of local capacities, institutional, human and technical resources for access to and exploitation of EO-based services on an operational basis for sustainable development in Africa”. Various services have already been built along the themes of Natural and Water Resources and Marine and Coastal Areas.

Link: <https://gmes4africa.blogspot.com/p/the-program.html> (last accessed 15.02.2023)

Objectives and aims that apply to this project from GMES & Africa have been extracted from the following documents:

[RD 10] GMES and Africa Corporate Brochure

Link:https://au.int/sites/default/files/pages/34807-file-gmes_africa_corporate_brochure_print_3.pdf (last accessed 15.02.2023)

[RD 11] GMES and Africa Training Strategy

Link:https://au.int/sites/default/files/pages/34807-file-09june2018_training_strategy_gmesandafrica_a4.pdf (last accessed 15.02.2023)

[RD 12] GMES and African Communication and Engagement Strategy

Link:https://au.int/sites/default/files/pages/34807-file-20180608_communication_and_engagment_strategy.pdf (last accessed 15.02.2023)

2.2 POLICY TRACEABILITY MATRIX (PTM)

The Policy Traceability Matrix (PTM) is a traceable list of requirements chosen from the aforementioned documents. Each requirement is given a unique identifier (**ID**) in the form of **Po-xx**, where xx is the number of the policy.

For each requirement identified, the 'solution' column provides an initial analysis of each requirement and a suggestion of how each can be addressed in the WaSCIA solution. Where there are any synergies between the policy requirements and the requirements that have already been identified from users [RD 1], these are noted. The source of the policy requirement is also given.

Table 2-1 Policy Traceability Matrix

ID	Policy Description	Proposed Solution to Meet Policy Requirement	Ref
Po-001	Efficient utilization and management of water requires the full participation of all stakeholders. The Dublin Principle No. 2 underlines the importance of a participatory approach in water development and management, starting at the lowest appropriate level.	We will develop the portal with our African partners who will lead on making the portal available to those who need and will encourage participation.	RD2
Po-002	Improvement of rainfall and runoff catchment and storage, including river-head forest management.	Out of scope for this project, but the water stress product will contribute to better water management and decision making.	RD2
Po-003	Promotion of alliances and partnerships between public and private research institutes, Civil society organizations (CSOs), universities and water-related industries to support the adaptation, transfer and application of new research.	WaSCIA consortium brings together industry with African public sector and academic organisations. The solution will be handed over to the African organisations to operate.	RD2
Po-004	Effective and efficient knowledge sharing across the continent and globally.	WaSCIA service will enable data and knowledge sharing through dedicated in-country workshop to fulfil capacity building requirements.	RD2
Po-005	The lack of adequate and reliable information or data and the failure to use available tools are major obstacles to enhancing water security in projects and programmes.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending to other African countries. The outputs of WaSCIA service will be provided along with quality information and validation reports to ensure reliability of the products.	RD2
Po-006	Reliable data to make evidence-based decisions on interventions within a water security framework.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending to other African countries.	RD2
Po-007	Agriculture is the largest water consumer in Africa, with an annual usage of about over 80 percent of its total exploited resources. The strategic use and management of water in agriculture is therefore key to both water and food security.	Water stress and climate information is a valuable input for crop monitoring, water management and therefore food and water security.	RD2
Po-008	Some of the water-related constraints on inland waterways include seasonal blockages caused by water weeds, and variable water levels that interrupts or reduce reliability of the service.	Not in the initial scope of the project but could possibly be an extension of it.	RD2
Po-009	Increasingly large amounts of water are being taken from the surface or aquifers for industrial purposes including manufacturing and extractive industries.	Not in the initial scope but water availability can be supported by WaSCIA water stress data.	RD2

Po-010	The Bank will support integrated disaster risk management and emergency response planning.	WaSCIA water stress and climate indices can support in-season drought monitoring, water availability, disease and areas exposed to wildfire risk.	RD2
Po-011	Support of ecosystem-based climate adaption and disaster management measures including supporting more hydro-meteorological stations for the better understanding of disaster risks, predictions and early warning mechanisms.	WaSCIA climate indices can complement the observations at hydro-meteorological stations in remote areas. Also the decision support tools developed for WaSCIA can be adapted for developing analytical threshold warning systems.	RD2
Po-012	The major blockages to the development of effective response measures to the impact of climate change in the water-dependent sectors such as agriculture include the limited availability and integration of water resources databases and climate change models.	WaSCIA will integrate EO and long-term historical climate reanalysis datasets to develop indices relevant to agriculture and water sector. The underlying data and models will be available to users to use as the basis for the analysis of historical trends for climate change impact assessments.	RD2
Po-013	Increased water security for Africa where transformed water assets as well as sanitation and hygiene improvements foster sustainable, green and inclusive socio-economic growth and development.	WaSCIA water stress and climate data can support drought monitoring, food security, and water security.	RD2
Po-14	Going forward, the Bank will actively seek to use the transboundary nature of water to enhance regional integration and promote conflict resolution.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending to other African countries.	RD2
Po-15	Integrated Water Resources Management (IWRM) principles should be used including: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.	WaSCIA promotes the inclusion of users, planners and policy makers through workshops and webinars, in close collaboration with our African partners.	RD2
Po-16	We will work to introduce water-specific insights – particularly on flood and drought management, a stated priority of most countries – into national dialogues on climate resilience-related development priorities. We will do so primarily through existing national processes as countries update their Nationally Determined Contributions under the Paris Agreement and develop, implement, and refine their National Adaptation Plans.	WaSCIA water stress and climate data can support drought monitoring and water availability. Flood management is out of scope at the moment but could be looked at in a project extension.	RD3
Po-17	Improving transboundary water governance through advocating for reducing disaster risks through data sharing.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending to other African countries. Users will be able to search EO & climate data catalogues, import data, discover and run the available processors.	RD3

Po-18	Integrated Water Resources Management (IWRM) at the local and regional levels and link those lessons to global insights. IWRM is a process that promotes the coordinated development and management of water, land, and related resources.	The WaSCIA service could support IWRMs at local and regional levels providing consistent data and insights. The service is supported by lessons learnt globally such as the models that are used.	RD3
Po-19	There are a number of compounding issues that also have a significant impact on water resources in Africa. The most significant ones are: Inadequate public awareness and stakeholder involvement.	WaSCIA will encourage stakeholder involvement throughout the project and promote the project to the public through websites, publicly available webinars and promotional materials.	RD4
Po-20	The key technological factor is the existence of critical gaps in data (ground and surface water information and knowledge in the water sector).	The WaSCIA service will provide high quality water stress and climate data information at a national level. Workshops will fulfil capacity building requirements.	RD4
Po-21	The Internet is a major instrument for overcoming some of the technological constraints.	WaSCIA service shall be deployed on cloud infrastructure with sufficient storage and processing power for generating the outputs. Future project extension could look at accessibility through mobile applications, but not currently within project scope.	RD4
Po-22	A second factor is climate variability, which creates untenable risks in the absence of inter-country and inter-regional cooperation.	WaSCIA will provide high-quality climate indices weekly to help monitor the risk from climate variability.	RD4
Po-23	The major environmental factor is climate variability (spatial and temporal) leading to drought, desertification, floods and other natural disasters. A second factor is environmental degradation from domestic, industrial and agricultural waste. A third factor is failure to allocate adequate water resources to sustain life-supporting ecosystems, both terrestrial and aquatic. Addressing these factors at the national and international level is absolutely critical for Africa's sustainable social and economic development. If they are not addressed, the prognosis is dire.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending it internationally to other African countries. This will help address the climate variability factor at the required level.	RD4
Po-24	Unfortunately, Africa does not have an adequate number of highly motivated and highly skilled water professionals who can deal effectively with the complex issues of water scarcity, climate variability and joint management of international waters.	Through providing free high-quality water stress and climate indices data, and by providing workshops to encourage the use, WaSCIA will hopefully help in the upskilling of professionals in the water field.	RD4
Po-25	Responding to immediate water problems; meeting urgent water needs. There is an inter-dependency between water and economic development.	WaSCIA provides weekly water stress and climate indices. The underlying daily climate information can also be provided (up to 5 days delay from present time).	RD4

Po-26	Create an enabling environment for international cooperation.	WaSCIA will promote cooperation between African countries through the development and continued use of the WaSCIA service. Though, the start of the service will initially focus on Senegal, this will extend. User engagement has already been across potential users across west Africa.	RD4
Po-27	Manage watersheds and flood plains to safeguard lives, land and water resources.	Not initially in the scope for the complete management of watersheds. Nevertheless, water stress indices can assist monitoring of water resources.	RD4
Po-28	Continued improvement of databases and information sharing on land and water.	The underlying WaSCIA data will be made available to users via the cloud storage. Users can synchronise this with their own databases if desired.	RD4
Po-29	Improving water wisdom: Raising awareness on water-management issues.	WaSCIA through user engagement via its platform, web pages and workshops will raise awareness of underlying water-management issues that may relate to water stress and climate indices.	RD4
Po-30	Improving water wisdom: Establishing a sustainable system for data collection, management, and dissemination, including standardization and harmonization of data.	WaSCIA will provide water stress and climate indices to users. As more users across Africa uses the data then the more likely that this data will become the standard format for these indices. This will be encouraged through the free use of the platform, promotion and education. Data format will be agreed beforehand but likely to be in standard GIS formats such as Esri Shapefile, NetCDF and GeoTIFF. Data will be validated with in-situ observations, the ideal form of which should also be decided within the project.	RD4
Po-31	Improving water wisdom: Conducting research and development on water-resources issues.	As part of the development of WaSCIA, workshops and continued research will mould the service to assist in the monitoring of water resources issues	RD4
Po-32	Improving water wisdom: Facilitating access to knowledge and information centres and services such as the Internet.	The WaSCIA platform will be free to users, providing easy access to its data and knowledge.	RD4
Po-33	Improving water wisdom: Mainstreaming gender and youth concerns in all activities.	The WaSCIA team is composed of different genders and ethnicities and the strength of diversity in our team will be clear during our workshops and other promotional material. Young users will also be encouraged.	RD4
Po-34	Adopting the river basin as the unit for water-resources management; Strengthening river-basin and aquifer management.	Not within scope of WaSCIA project.	RD4

Po-35	Managing climate variability and change, including drought, desertification and floods.	Drought indices will be provided by WaSCIA as a core component. Other indices such as surface wetness indicators, and precipitation will also be provided.	RD4
Po-36	Developing effective systems and capacity for research and development in water and for the collection, assessment, and dissemination of data and information on water resources.	The WaSCIA project will develop a platform for the collection and processing of data that will be used to create water stress and climate indices. The platform will enable users to assess and interrogate the data.	RD4
Po-37	The consequences of the deterioration of water quality include eutrophication and the proliferation of invasive aquatic plants. Eutrophication is a factor mainly in lakes.	Not currently in scope but future extensions could look at monitoring of water quality in lakes, particularly signs of eutrophication and evasive plants.	RD4
Po-38	A key limitation at national, sub regional and continental level is the paucity of data on water resources. This limitation is linked to inadequate human capacity for the collection, assessment and dissemination of data on water resources for developing, planning and implementing projects.	WaSCIA will provide high-quality reliable weekly water stress indices data and provide workshops on how to evaluate this data.	RD4
Po-39	Africa's agriculture will be modern and productive, using science, technology, innovation and indigenous knowledge.	WaSCIA high-quality water stress and climate indices data can support decision making in regard to agriculture.	RD5
Po-40	An Africa whose development is people-driven, relying on the potential of African people.	The WaSCIA project will not only involve African stakeholders but will actively encourage their participation and assistance throughout the project length.	RD5
Po-41	Consolidate the modernisation of African agriculture and agribusinesses, through scaled up value addition and productivity, including expanding the introduction of modern agricultural systems, technology, practices and training.	WaSCIA high-quality water stress and climate indices data can support decision making in regard to agriculture.	RD5
Po-42	The private sector will work closely with public, education and research, societal, funding and national and international development agencies to facilitate technology transfer, collaborate in commercializing and exploiting research and innovation and support building the necessary capacities and technical competencies required to achieve the objectives of the Strategy.	The WaSCIA project actively looked to involve both the private sector with various public sector bodies, particularly in Africa, to ensure not only a project team of many capabilities and experiences, but also a wide range of users who we want to be involved throughout the project length.	RD6
Po-43	The wide-scale affordability of new technologies will be one important factor for minimizing the digital divide.	WaSCIA platform will be open source and the underlying data are free of charge. The only cost is the deployment cloud infrastructure which is low cost.	RD7



Po-44	Shifts in patterns of land use and how we manage our global food systems are also needed to reduce carbon emissions: agriculture, deforestation and wetlands development contribute 23% of all human-caused greenhouse gases.	Land use monitoring is not in the scope of the project but could be considered in future iterations.	RD7
Po-45	Establish communities of practice for the sharing of experience and best practices, as well as the definition of user needs.	WaSCIA platform will enable data and knowledge sharing. Workshops will fulfil capacity building requirements. User needs will be compiled and reviewed throughout the project to ensure we are developing a long lasting and meaningful service.	RD8
Po-46	Space-derived products and services used for decision-making and addressing economic, political, social and environmental challenges.	WaSCIA water stress and climate data can support drought monitoring, food security, water availability, disease and areas exposed to wildfire.	RD8
Po-47	Addressing user needs – harnessing the potential of space science and technology to address Africa's socio-economic opportunities and challenges.	User engagement throughout the agile development process will help to tailor the solution to the user needs. We will continue to probe the users' needs to ensure that what we are providing will help address Africa's socio-economic challenges.	RD8
Po-48	Strengthening research, development and innovation in the continent by increasing the number of services and products using African capacities.	The WaSCIA platform will be a brand-new service that will support research and development in water, climate and environmental fields. New data products of climate and water stress indices, plus the underlying data will be available to the users. The service will be developed with African's to eventually be passed to Africa for continued management and development.	RD8
Po-49	International partnerships should be encouraged to address any remaining gaps and pursue new learning opportunities through active participation in global space initiatives.	WaSCIA is an international partnership between Europe and Africa, to build a platform for monitoring indices water stress and climate.	RD8
Po-50	Climate EO data – 5 to 20m resolution, daily.	WaSCIA plans to provide weekly climate and water stress indices data. It is not in the scope to provide Climate EO data at this resolution. Climate indices 9 km resolution.	RD8
Po-51	Water EO data – 50cm > 30m, seasonal.	WaSCIA plans to provide weekly climate and water stress indices data. Water stress data 30 m resolution.	RD8
Po-52	Agriculture EO data – 2.5m > 30m, daily.	Not within initial scope but could be provided after consultation with end users e.g. NDVI.	RD8
Po-53	Developing adequate skills and expertise in Earth observation applications and usage.	WaSCIA platform will enable data and knowledge sharing. Workshops will fulfil capacity building requirements.	RD8



Po-54	Fostering knowledge sharing among African experts, users and stakeholders.	WaSCIA platform will enable data and knowledge sharing. Workshops will fulfil capacity building requirements.	RD8
Po-55	Developing Earth observation services and products using web-based and other appropriate technologies in order to meet user needs.	WaSCIA will develop a web-based UI to meet our user needs.	RD8
Po-56	Fostering stakeholder engagement to ensure the generation of the relevant services and products that maximise the benefits of Earth observation applications.	User engagement throughout the agile development process will help to tailor the solution to the user needs.	RD8
Po-57	Raising awareness among the public, users, and policy and decision makers.	Workshops and project website will help raise awareness of the project.	RD8
Po-58	Develop a data-sharing policy that ensures affordable and equitable access to spatial data and information.	WaSCIA platform will be open source and the underlying data are free of charge. The only cost is the deployment cloud infrastructure which is low cost.	RD8
Po-59	Develop timely access to the right data sets in accordance with user needs.	WaSCIA provides weekly water stress and climate indices. The underlying daily climate information can also be provided (up to 5 days delay from present time).	RD8
Po-60	Develop the provision of appropriate services and products that respond to all user needs.	User engagement throughout the agile development process will help to tailor the solution to the user needs.	RD8
Po-61	Develop robust processing capabilities to ensure that timely access to the requisite services and products are available to end users.	WaSCIA service will take advantage of the WASDI platform features which includes enhanced web-based interfaces that allow seamless integration of tools and workflows.	RD8
Po-62	Ensure that all levels of governments are able to access space and ground-based data through a centralised portal.	WaSCIA service will provide access to different types of users, from scientists and researchers to government decision makers can benefit from the service and obtain the information they need at requested granularity.	RD8
Po-63	Provide geospatial and scientific data for education, and research and development.	The WaSCIA service will provide high quality water stress and climate data information at a national level for Senegal, with the goal of extending to other African countries.	RD8
Po-64	Provide geospatial data for commercial exploitation at a minimal cost.	The underlying datasets and indices will be made available to users free of charge. ESA encourages commercial exploitation of publicly available data/services developed through EO-Africa program.	RD8
Po-65	Ensure availability and sustainable management of water and sanitation for all.	WaSCIA provides weekly water stress and climate indices which can used as part of the management of water resources. The platform will be free to use.	RD9



Po-66	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.	Drought indices will be provided by WaSCIA as a core component. Other indices such as surface wetness indicators, and precipitation will also be provided.	RD9
Po-67	By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	WaSCIA high-quality water stress and climate indices data can support decision making in regard to agriculture.	RD9
Po-68	Strengthening EO data access and sharing practices and policies in promoting intra-African collaborative actions.	WaSCIA service shall enable users to search EO & climate data catalogues, import data, discover and run the available processors. All underlying data will be available and free-to-use for WaSCIA users.	RD10
Po-69	Conduct capacity development on Earth Observation for integrated decision-making.	Capacity development will be undertaken with training for the WaSCIA end users through in-country outreach workshops and online webinars	RD10
Po-70	Strengthen awareness and outreach of Earth Observation among stakeholders including the private sector, policy makers and the general public.	Workshops and project website will help raise awareness of the project.	RD10
Po-71	Building on the existing expertise – GMES & Africa places emphasis on the utilization of existing capacities, as it seeks to strengthen additional specialized skills through training.	Similarly, WaSCIA platform is built on existing cloud architecture and models. The programme will strengthen skills with users through workshops and user guides.	RD11
Po-72	In order to enforce value addition to products and most importantly to create an innovative medium of reaching end-users, EO and ICT should be integrated and considered part of the service delivery cycle.	WaSCIA will be deployed on the WASDI platform. It shall enable users to search EO & climate data catalogues, import data, discover and run the available processors.	RD11
Po-73	Institutions are strongly encouraged to make use of the free and openly available software instead of purchasing other expensive licenses.	WaSCIA platform will be open source and the underlying data are free of charge. The only cost is the deployment cloud infrastructure which is low cost.	RD11
Po-74	Inspire a sense of ownership to the African public.	WaSCIA will be developed alongside African partners and will be passed on them for continued support and development at the end of the project. It will be very much an African owned resource and should be promoted as so.	RD12

3 CONCLUSIONS

In the previous section, various policy requirements and aspirations were selected from 11 different publications, which related to the water stress and climate data, water and agriculture in general, the use of space assets and all in relation to Africa. Other publications were also reviewed but did not garner suitable requirements.

The task of identifying Policy Requirements related to this project was difficult, especially identifying needs in terms of monitoring, assessment and reporting. Most of the documents were focusing on high-level desires rather than specifics that would relate to a project such as this. Some specifics around data requirements were taken from the AU African Space Strategy [RD 8], which are detailed in Policy Requirements Po-50, Po-51 and Po-52, but this type of information was few and far between.

Many of the requirements from the different documents are very similar in their desire. Though this may seem repetitive, it does enable us to identify some key takeaways, including:

Monetary considerations – the need for affordable data and platforms so that users are not priced out of taking advantage of technology.

Accessibility – similar to above, but not just the cost, the need for technology to be easily accessible to everyone e.g. platform available through internet, easy to use interface, underlying data available.

Involvement of Africans – developing technology for Africa with Africans, interacting with Africans from top to bottom, so that services are shaped to their needs and that they can ultimately take responsibility for it.

Knowledge-sharing and Data-sharing – suitable mechanisms for freely sharing data and knowledge is desired across Africa to enable Africa to progress quickly.

Awareness – spreading awareness of the issues and solutions, including from space-assets, will help garner support, teach people (e.g. need of good data), increase user base, and hopefully inspire people in Africa to get involved.

Development – there is a desire and excitement that with the right investments of people, time and money, the development of Africa can accelerate.

Partnerships – there is a recognition that to reach where it wants to be, partnerships are required to bring together different skills, knowledge and funding, inside and from outside of Africa.

Scales of Participation – desire for development and involvement in technical work to be on at all levels – national, international and regional, but also transboundary, where water bodies and watersheds are in multiple countries.

Specific user case-studies – mostly high-level mentions of climate, water and agriculture were observed but more specifics such as data and analysis for drought, desertification, to niche products for issues such as eutrophication.

Analysing a word cloud (Figure 3-1) of the Policy Requirement text, further highlights some of the takeaways above such as water, development, data, drought, knowledge, available etc. However, other keywords become apparent such as:

Effective – for the project to be successful it needs to be effective. The WaSCIA service to be effective needs to be taken up at the project end by the African end-users and contribute towards its sustainability goals.

Integrated – the WaSCIA service should not be just considered singularly, but throughout the project there should be focus on how it can integrate into wider workflows and management plans.

Capacity – WaSCIA service will enable data and knowledge sharing through dedicated in-country workshop to fulfil capacity building requirements. WaSCIA will also add to the resources that are freely available in Africa for monitoring the environment.



Figure 3-1: Word cloud of top 75 words from the selected Policy Requirements

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