WRC PROJECT

WatSanNet AFRICA
WATER AND SANITATION NETWORKS ACROSS AFRICA

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Project Finalisation
Final Report

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1 EXECUTIVE SUMMARY

This study was funded by the Water Research Commission (WRC) in South Africa and awarded to Stellenbosch University as host of the AUDA-NEPAD Southern African Network of Water Centres of Excellence (SANWATCE). The study aimed to understand who the role-players in the water and sanitation sector in Africa are, their mandates, geographical scope and how they are aligned with regional, continental and global agendas. It further aimed to identify gaps and alignment between initiatives and provide recommendations on strategic gaps.

By collaborating with the African Ministers’ Council on Water (AMCOW, the AUDA-NEPAD and twenty universities and research institutions in the AUDA-NEPAD Networks of Water Centres of Excellence across Africa, this project made use of quantitative and qualitative research methods to achieve this aim. A literature review was conducted, which informed a bibliometric analysis of citation data, semi-structure questionnaire and individual in-depth interviews with key stakeholders in the field. The bibliometric data analysis was based on the publication and affiliation data obtained from the Web of Science citation database, which provided information for the country profiles in terms of the predominant institutions responsible for water and sanitation research and predominant funding agencies. An online questionnaire was disseminated via WhatsApp, LinkedIn and direct emails to various digital communities related to water and sanitation related sectors across African. The primary aim of this instrument was to gain more qualitative information on the predominant enablers of water and sanitation related activities across African regions. Based on the identified key enablers, in-depth key stakeholder interviews with 13 experts were conducted to gain more qualitative information on the gaps, challenges and opportunities within the sector, in terms of organisational and institutional alignment of research mandates and national, regional, continental and global guiding frameworks/policies.

The outcomes of the study provide the Water Institute Alliance (WIA) and other role-players such as RECs, the AU, implementing partners, and relevant stakeholders evidence to make better decisions with research and capacity development initiatives in the water and sanitation sector in Africa. The impact of better decision-making can permeate through continental, regional, national bodies and translate to multi-stakeholder decision-making bodies such as River Basin Organisation and riparian states, to improve the lives of local communities.

Many significant enablers are specific to certain regions in Africa (See Section 20: Annexure A for list of key enablers with contact details). The Water Research Commission (WRC), National Research Foundation (NRF), WaterNet, the AUDA-NEPAD SANWATCE and Cap-Net are prominent in Southern African. In Central Africa, the Swiss National Science Foundation (SNSF) and the Belgian Technical Cooperation (BTC) are significant enablers. In East Africa, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and United Nations Educational, Scientific and Cultural Organization (UNESCO) are prominent enablers, while in North Africa, the French National Research Agency is the most prominent. Finally, in West Africa, the significant enablers are the Swedish International Development Agency (SIDA), OMVS - Senegal River Basin Development Organization and the French Development Agency. Many identified significant enablers were relevant to most or all African regions. These include the European Commission, USAID, World Bank, Bill and Melinda Gates Foundation, Consultative Group on International Agricultural Research (CGIAR), United Kingdom Research and Innovation (UKRI), African Ministers’ Council on Water (AMCOW), Africa Water Association (AWA), Africa River Basin Organisations (ANBO), Forum for Agricultural Research in Africa (FARA) CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development), International Water Management Institute Africa (IWMI) and the Arab Bank for Economic Development in (BADEA). (See Annexure A for contact details).
As a number of enablers were specific to certain areas in Africa (See Section 15 on Regional Profiles), some challenges are also unique to specific regions in Africa, such as the lasting legacies of the French occupation in West, Central and North Africa continue to provide challenges for these countries. Apart from the lasting dependency on French enablers in these areas, language remains a significant barrier for Francophone countries, to be able to effectively communicate with other African countries. Most gaps and challenges are continental, meaning that external enablers which often have their own research agenda, influence the outputs of beneficiary organisations and this may not align with the agenda and vision of African nations and region-specific. Regarding enabler mandates, misalignments are common among beneficiary organisations, and no unified framework exists. This leads to the isolation of research interventions, as well as a duplication of research and other water and sanitation-related activities. Regarding policies and frameworks relating to water and sanitation, it was found that there is a consensus of regional, continental and global alignment. Guiding documents are also well-consulted and robust. However, there is a significant lack of proper monitoring and evaluation (M&E) and implementation decrees, political will, funding and commitment to WASH.

Certain recommendations were formulated to address the most profound challenges. Refer to Section 17 (Gap Analysis and Recommendations) for detailed information on each African regions and Section 18 for the Way Forward, with particular reference to the role of the WIA. To summarise, researchers should be encouraged to share and disseminate results, while (regional) database(s) of research and knowledge production in the water and sanitation sector in established to ensure better coordination of efforts and better marshalling of external resources, but to also provide support for the proposed increase in domestic funding. In Southern, West, Central/East Africa, it is recommended to utilise existing research and information database system to coordinate support, disseminate and share research, increase human capital development in the region to better support research in the field.

Also, in terms of research, themes of sanitation, groundwater and the quantification of groundwater availability should receive more attention. Furthermore, governments need to assert their respective research agendas when engaging with enablers. In-country, national governments need to increase funding, commitment and political will toward WASH activities, while implementing M&E instruments and shifting priorities, to decrease their dependency on foreign funding. Quantification of expenditure/financing on Water Supply, Sanitation and Hygiene needs attention. This will further support tracking and accountability.
2 GLOSSARY

Water Institute Alliance (WIA): The Water Research Commission has taken the lead in establishing the WIA, to eventually support water sector partners operating across Africa which could support the research and innovation systems across the continent.

Research Uptake and Utilization is the process of research findings communicated to and used by a target audience to inform the development of new policies and procedures.

Regional Economic Communities (RECs) are regional groupings of African states which are involved in facilitating regional integration within the wider African Economic Community (AEC). The RECs serve as the building blocks of the African Union.

AUDA-NEPAD Networks of Water Centres of Excellence: Networks of Water Centres of Excellence were established by the ministers responsible for water and the minister responsible for science & innovation in 2006.

Research Associations are bodies that consist of scholars in their research field that have chosen to associate themselves with one another by becoming members of a specific association.

Research Forums are places in which researchers come together to engage and discuss with each other on important research within a specific field on a regular basis, such as conferences.

Research Networks in this context are to be understood as networks of collaboration between multiple researchers, research institutions and organisations working together around specific research fields or themes.

3 BACKGROUND AND MOTIVATION

Research institutions operate within a research system that, if effective, contributes to the knowledge production, dissemination and utilization of research. Characteristics of such research systems are dense populations of formal scientific institutions, such as universities and institutes, conducting Research and Development (R&D) in and outside the higher education sector, and thus contributing towards knowledge production (Mouton, 2008). Research is disseminated through journals which are maintained by scientific publishing houses, and conferences, workshops and seminars are regularly conducted within the science system. Knowledge utilization and commercialization are also promoted through patent offices, technology incubators and technology transfer offices, thus, if effective, contributing towards an effective research system. Where such research systems fail or components thereof do not function effectively, inadequacies could arise in the quality and relevance of technologies being researched and developed, especially where institutional and policy environments change. The result could lead to a slow adoption rate of technology transfer (Weijenberg et al., 1995) to name but one of the negative effects.

The Water Research Commission has taken the lead in establishing the Water Institute Alliance (WIA), to eventually support water sector partners operating across Africa which could support the research and innovation systems across the continent.

4 AIM AND OBJECTIVES

This study aimed to understand who the role-players are, their mandate, geographical scope and how they are aligned with regional, continental and global agendas specifically concerning the water and
sanitation sector. This knowledge identified gaps and alignment between initiatives and provide recommendations on strategic gaps which can be addressed.

Considering how to achieve this aim were the following objectives:

- Identify and develop an inventory of the existing water, sanitation and related RDI institutional groups, associations, partnerships, forums and networks operating in the five African regions (Southern, Eastern, Western, Central and Northern).
- Analyse each network’s institutional mandate, geographical scope, strategic objectives, and alignment with the broader African water and sanitation policy agendas such as the Agenda 2063, the Science, Technology and Innovation Strategy for Africa (STISA-2024) and Sustainable Development Goals (SDGs), with special focus on SDG6 which is to ensure availability and sustainable management of water and sanitation for all.
- Identify synergies, duplications or conflicts of interest between the continental and regional strategies and plans.
- Identify systemic gaps (continental and regional level) relating to the priorities in the agendas and existing enabling support instruments.
- Establish if there is alignment between the existing water, sanitation and related RDI agendas and the continental and or regional challenges and needs.
- Establish if the existing institutions/networks can provide the knowledge and solutions required to address the challenges and bridge the gaps.
- Conduct an analysis to see if the institutions can implement all activities that they are mandated to implement effectively.
- Provide recommendations on the strategic gaps are that can be addressed by a multi-institutional, multistakeholder partnership mechanism such as WIA.

By collaborating with the African Ministers' Council on Water (AMCOW, the AUDA-NEPAD and twenty Universities and Research institutions in the AUDA-NEPAD Networks of Water Centres of Excellence across Africa, this project made use of quantitative and qualitative research methods (such as surveys, a bibliometric analysis of citation data, individual interviews and validation workshops) to achieve the above-mentioned aim and objectives.

5 CONTEXTUALISATION

Various universities, research institutions, institutions addressing Technical Vocational Education Training (TVET) and partners do provide research and capacity development programmes in Africa and are often closely linked in collaboration through formal and informal collaborations. Such collaborations are often between individual researchers, or as institutions through formal programmes, often mandated from either a continental level, such as the African Union (AU) and the African Union Development Agency AUDA-NEPAD, regional, through the various Regional Economic Communities (RECs) or direct at a country level. By way of example, it has been determined that at least 28 accredited public universities offer water-related courses in the SADC region. Examples in Southern Africa include the Institute for Water Studies (IWS) at the University of the Western Cape (UWC), the University of Stellenbosch Water Institute, both in South Africa, the International Center for Water Economics and Governance in Africa (IWEGA) at the University Eduardo Mondlane (UEM) Mozambique and the University of Malawi (UNIMA). At least one accredited public university per SADC country offers high-level research and capacity development in the water sector (AU/NEPAD SANWATCE, 2012).

As indicated in the Terms of Reference of this proposed project, the Water Research Commission (WRC), established the Water Institute Alliance (WIA), to "proactively respond to... complex and
systematic water-related problems in various countries in Africa and her economic regional blocs in terms of Africa’s prosperity and infrastructure investment models”. To give effect to its mandate, the WIA requires up-to-date information on the research and capacity development landscape across Africa. It is important to understand who the role-players are, their mandate, geographical scope and how they are aligned with regional, continental and global agendas. This knowledge identified gaps and alignment between initiatives and provide recommendations on strategic gaps which can be addressed.

6 LIMITATIONS

Limitations with this study were that there has been a change of names in both institutions and enabling agencies, such as the amalgamation of UK funding agencies into UK Research and Innovation (UKRI). The data has been kept intact with the historical names to denote their funding in previous years and can contribute to contrasting with if the UKRI funding has kept up with the previous entities’ funding. Another aspect has been the change in the names of certain countries and institutions. The Kingdom of Eswatini is the prime example here.

The other limitation was that the database being used is based on the Web of Science. It is a large and comprehensive database, but it does not capture every single publication in the field published by African countries. This is being supplemented by the primary data gathering through surveys to have a analyse the domestic situation at a more granular level. A second limitation to this database was that not all funding acknowledgements were available as it is not compulsory to list funding acknowledgements with publications. This is still, however, becoming an important source of information in the scientific community to track science funding (Alvarez-Bornstein, Morillo & Bordons, 2017).

7 ENVISAGED OUTCOMES OF THE RESEARCH

The outcome of the study provides the WIA and other role-players such as RECs, the AU, implementing partners, relevant stakeholders to make better decisions on research and capacity development initiatives in the African and Sanitation sector. The impact of better decision-making would permeate through continental, regional, national bodies and translate to multi-stakeholder decision-making bodies such as River Basin Organisation and riparian states, to in effect, better the lives of local communities.

8 EXPECTED IMPACTS

1. Improved understanding of the policy, research and institutional landscape of the Africa water sector.
2. New value-adding activities to facilitate and support improved water sector decision-making through STI.
3. Identification of gaps for improved research and capacity development.
4. New models and partnerships to improve investment in water RDI programmes.
5. Targeted, high impact and improved coordination of activities by the sector.
6. Increased multi-stakeholder collaboration and partnerships.
7. Acceleration and uptake of knowledge products through different stakeholder groups in the African continent.
8. New immediate business and water STI opportunities identified for the SADC region and the rest of the African continent in the medium to long term.
9  RESEARCH ETHICS

Permission to conduct this research through surveying and interviews with the various water research institutions and participants were sought through a research ethics committee at Stellenbosch University. When setting up any meetings and interviews with key stakeholders, they received a briefing note on the project. Any documents or reports provided that were not in the public domain were treated with sensitivity. If the researchers wanted to use any information from these reports, they only did so with their written permission and by citing the author of the report/document, unless they indicate otherwise. Only the researchers had access to the raw dataset and the contact details of any research participants/contacts. This data was only kept as long as it was required for the project as per Section 14 of the Protection of Personal Information (POPI) Act of 2013, with any exceptions to this falling in line with the appropriate subsections of the Act.

No personal, identifiable details were used in any write-up of the findings, and the various participants were identified with appropriate identifiers which did not allow for identification with external parties. Although this research aimed to map out the water and sanitation research ecosystem of the African continent, the researchers took care not to ask probing, personal, awkward or sensitive questions. The research had a low risk of participants being exposed to potential physical, emotional, economic, legal, reputational and/or psychological risks/harm during the study. All research data was stored on the researchers’ password-protected computer along with the use of the cloud through Microsoft's systems, which have an agreement with the university as to how such data cannot be used by the provider.

All participants were provided with information sheets and asked to complete a written consent form. Participants took part in this research voluntarily and could choose to stop the interviews or their participation at any point. If a participant chose to stop their participation, the participant was given the option to allow the researcher to use any information provided until that point, or to remove that information from the findings completely. The research was conducted primarily in English, but translators were be employed as required. Consent forms and information sheets were available in English and as needed translated into the lingua franca of the participant. Participants were allowed to give their consent, or refuse to consent, to the interview being digitally recorded. This consent was sought at the beginning of the interview.

Through working as a team across the multiple African regions, it allowed for each of the research team to cross-check as much of the work as possible with the information and data gained from participants to as far as possible prevent researcher bias to be a factor. This was also done by using the expertise of the water and sanitation field with an established definition of the Water Resource category through databases of the Web of Science to ensure that research institutions were correctly categorised in this study, instead of potential researcher bias making a judgement on its inclusion as far as possible.

It is through these multiple steps that as researchers, social responsibility and the duty of science towards society were met, as the results were a net benefit to the continent in terms of how it can achieve better results through capacity development in the identified gaps. Providing water and sanitation to the continent does not just fall under the 6th Sustainable Development Goal but also the African Union's Agenda 2063 Aspiration 1. The potential benefits, we believe, thus outweigh the risks in terms of what this project could potentially achieve over the long term in terms of improved water security and access to sanitation on the continent.
10 METHODOLOGY

To achieve the aim and objectives envisaged for this study, the work was divided into the following tasks: A combination of qualitative and quantitative methods were employed. By making use of qualitative- and quantitative research techniques, existing (secondary) and primary data were collected to support the aim and objectives of the study, but also to triangulate findings.

10.1 Existing (secondary) data collection

10.1.1 Literature review/review of existing reports

A literature review was conducted to provide context as to what water and sanitation research is and to illustrate what this project considered water and sanitation research to be. This allowed for a common definition and rubric to be used when including or excluding research bodies in the mapping of the African continent’s water and sanitation RDI groups. This, along with the bibliometric analysis, allowed for the project team to also discover more RDI groups to be added to the map that could have been potentially missed during any stage of the project.

10.1.2 Analysis of bibliometric data

A bibliometric analysis of citation data was undertaken to identify the organisations that have been funding research in the African water and sanitation sectors. For example, Elema (2019) found that in the SADC region, the Water Research Commission (WRC) and the South African National Research Foundation (NRF) are significant funders of research in the region. The study further highlights that more than 80% of water research in the region is done by researchers affiliated with South African universities and research institutions, thus amplifying the contribution by South African research funders in the Southern African region. The list of journals that fall under the Water Resource category on the Web of Science is included in Annexure D. It is within these journals that a large amount of the body of Water Resources work takes place, so a bibliometric analysis of these journals allowed for access to important data in terms of finding links between funding, research and institutional bodies.

For the bibliometric study, primary data captured in the Clarivate Analytics™ Web of Science™ Core collection database¹ was used, with a stepped approach followed to identify citation data for the present study.

   Step 1: all publications, across all research areas in the Clarivate Analytics™ Web of Science™ Core collection database were identified for the period 2010 to 2020, with publications including ‘all languages’ and ‘all document types. Publications were cross-checked with Elsevier’s Scopus®², which is an abstract and citation database.

   Step 2: Making use of the global dataset, all African countries were identified, resulting in a query: COUNTRIES/TERRITORIES (SOUTH AFRICA or EGYPT or NIGERIA or MOROCCO or ALGERIA or KENYA or TANZANIA or ETHIOPIA or UGANDA or CAMEROON or GHANA or ZIMBABWE or SENEGAL or SUDAN or MALAWI or ZAMBIA or BOTSWANA or BURKINA FASO or LIBYA or BENIN or MALI or MADAGASCAR or GABON or MOZAMBIQUE or GAMBIA or NAMIBIA or NIGER or MAURITIUS or RWANDA or CONGO

Step 3: The data set was also broken down into the five regions of the African Union: Northern, Western, Eastern, Southern and Central. This allowed for a regional analysis on top of the wider continental research project. The regions and their respective countries are as follows:

**Northern:**
- Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia.

**Southern:**
- Angola, Botswana, Eswatini/Swaziland, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe.

**Eastern:**
- Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania and Uganda.

**Western:**
- Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea-Bissau, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

**Central:**
- Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

One of the major challenges in defining ‘water research’, was that it is not a well-defined research field, and can be classified as interdisciplinary (Pouris, 2013). In terms of bibliometric studies, the interdisciplinary nature of water research provided challenges in extracting citation data from the Clarivate Analytics™ Web of Science™. However, Clarivate Analytics™ Web of Science™ provided a single category for ‘water resources’ which accounts for the ‘core’ journals in the field of water research, which further accounts for the most important and highest impact literature on water research (Pouris, 2013). Refer to Annexure D for a list of journals reflected in the Clarivate Analytics™ Science Citation Index categorised under the ‘water resources’ category (See https://jcr-clarivate-com.ez.sun.ac.za/JCRHomePageAction.action).

Along with the global, African and SADC datasets, publications that were categorised as ‘water resources’ in the Clarivate Analytics™ Web of Science™ Core collection database were identified. Once the core citation dataset was identified, data was divided into the five African Union Regions. Clarivate Analytics™ Web of Science™ further provided categories for funding institutions, which were analysed for the various regions to identify the major funding institutions. One recognised that there might have been limitations in the data, given that it was based on funders acknowledged in articles, and not all research did acknowledge their funding institutions. However, even considering such limitations, the data still provided a reasonable indication of funding sources along with the bibliometric analysis being cross-referenced with the results of the online survey.
10.2 Primary data collection

10.2.1 Online survey

Since its inception in the mid-2000s, the AUDA-NEPAD Networks of Water Centres of Excellence have undertaken various research and capacity development projects in Southern, Western, Central and Eastern Africa. These projects included engagements with various stakeholders in the Water and Sanitation Sector, and included representatives from Government, Academia and Society. Project partners included the European Commission Joint Research Centre, UNESCO, AMCOW, AUDA-NEPAD and Regional Economic Communities such as SADC, ECOWAS and the EAC. In addition, PAUWES (part of the Pan-African Universities) were contacted to access relevant stakeholders for this project for the North African region. As part of the project, a survey was developed, distributed and the outcomes analysed through the partners and networks to address the objectives as set out in the Terms of Reference of the project. This survey was sent out through the various RDI groups such as the AUDA-NEPAD Networks of Water Centres of Excellence (SANWATCE – Southern Africa, WANWATCE – Western Africa, CEANWATCE – Central/Eastern Africa), WaterNet, WASSCAL and AMCOW, to name a few, to acquire information as to what other organisations they engage with at research and administrative levels to discover more entities to engage.

10.2.2 One-on-one semi-structured interviews

The online survey and analysis of the bibliometric data were followed up with individual interviews with relevant role-players across the continent. By making use of the partner Secretariats in Western and Central/Eastern Africa, relevant stakeholders were interviewed to gather regional-local information. In addition, by making use of online platforms such as MS Teams or Zoom, interviews were conducted to access information relevant to the objectives of this project. The semi-structured interviews were primarily focused on providing deeper qualitative data beyond that of the survey, as the questions focused on the research associations, forums and networks that the participants are a part of, as well as how they interact with one another with the wider African Union and Regional Economic Community and their respective objectives. It also engaged their funding streams and how they have changed over time along with their developing relationships with their funders. It also provided a deeper understanding of the implementation of policies and strategies, which were compared to the wider regional, continental and global frameworks. Refer to Annexure E for themes and potential questions.

10.2.3 Validation workshops

The outcomes of the online survey, the bibliometric analysis of funders in the African water and sanitation sector and one-on-one interviews were collated and presented in an initial draft report, the report addressed the aims as set out in the Terms-of-Reference of the project and formed the basis for validation workshops. At least five validation workshops were planned for this project (one in each of the African Union regions), with the support of AMCOW and AUDA-NEPAD.

11 PROJECT DELIVERABLES

The following deliverables were planned for the project and were aligned with the project agreement.

0. Deliverable 0 (D0)

   Inception Report: The Inception report outlines the methodology, plan of action on how the study will be conducted, clear activities, timelines and total proposed budget presented to the WIA Task Team

   Target date: 14 June 2021.
1. **Deliverable 1 (D1)**
   **Progress report 1:** Presentation of the first progress report
   Target date: 30 September 2021

2. **Deliverable 2 (D2)**
   **Progress report 2:** Presentation of the second progress report (including a summary of the focus group engagements) presented to the Task Team.
   During this stage, a presentation at WRC Symposium was envisaged to share the draft study findings at the launch of WIA during the WRC Symposium and provide a report of the launch proceeding.
   Target date: 19 October 2021

3. **Deliverable 3 (D3)**
   **Presentation:** Presentation of the findings to the WIA task team and interested parties
   Target date: 19 November 2021

4. **Deliverable 4 (D4)**
   **Final report:** Submission of the final report to the WRC - A final ready to print report incorporating input from the Task Team meeting and launch event.
   Target date: 8 December 2021

5. **Deliverable 5 (D5)**
   **Project finalisation:** Final submission of all reports and final invoice
   Target date: 16 December 2021
12 PROJECT TEAM

The following team will coordinate and undertake activities in this project, to achieve the aims and objectives.

Dr Nico Elema                  Project PI and Principal Researcher
Mr. Carinus de Kock           Project Manager
Prof Awa Niang Fall           Researcher
Prof Gamal Abdo               Researcher
Ms. Zimbili Sibiya            Researcher – PhD-Student
Ms. Nishai Moodley            Researcher – M-Student
Mr. Eduard Beukman            Researcher – M-Student

13 PROGRESS TO DATE

The following section highlights the progress made throughout the project up to 16 December 2021. The section highlights progress in terms of Administration, Dialogues and Data where progress in terms of the literature review, the bibliometric data assessment, the online survey, the analysis of the data and interviews are reported upon.

13.1 Administration

For this project, Mr. Tiyani Chauke is the Project Administrator from the WRC, and Dr. Nico Elema were the Project Administrator and Project Principal Investigator.

Formal communication on the award of the project to Stellenbosch University was received on 8 June 2021. Considering that the start and conclusion of the project were envisaged earlier in the project proposal, the project timeframe was adjusted to commence with the award letter, and the project concluded on 16 December 2021 (6 months as envisaged within the original Terms of Reference). In addition, the contracting on the project was concluded on 9 September 2021, following the review of the agreement by both organisations. The conclusion of the contract did not hinder the progress of the project, with activities initiated along with the awarding of the project in early June 2021.

From a project implementation perspective, the project team was assembled at Stellenbosch University, with weekly virtual project meetings taking place to maintain momentum on the project. In addition, Project meetings were undertaken with Prof Awa Niang-Fall from Cheikh Anta Diop University in Dakar, Senegal and Prof Gamal Abdo from the University in Khartoum to disseminate preliminary findings to member institutions for revision and facilitation of interviews planned for the next stage of the project.

As part of the deliverables of the project, the Inception report (Deliverable 0) was delivered on 14 June 2021, with Progress Report 1 delivered on 30 September 2021 as per the project schedule. A further Progress Report 2 was delivered on 18 October 2021 and 19 November 201, and providing insight into the continuous progress and refinement of the data collections as the project progress with input from the WIA Task Team.

13.2 Dialogues

As part of this progress report, it is indicated that the project team met with the Water Institute Alliance (WIA) Task Team as part of the initialisation of the project on 10 August 2021. During this meeting, the Inception Report and draft survey instrument were presented. The meeting provided the opportunity for the WIA Task Team to give feedback on the project and the draft survey instrument.
In addition, Dr Nico Elema presented the project as part of the 5th WRC Symposium during the session where the WIA was launched (21 September 2021). This meeting provided an opportunity for a broader awareness of the WIA, the WatSanNet project and an opportunity to answer questions participants to the event might have had.

13.3 Data
The study included both qualitative and quantitative research methods and for each country, a profile was created providing a brief overview of water and sanitation research in the country, the predominant water and sanitation research institutions, the water and sanitation research focus areas of the institutions and the predominant institutions supporting water research in the country which is the main focus of this project. Information in the country profile was based on the bibliometric data and further supported by feedback from an online questionnaire and interviews (Refer to Section 16). Finally, the predominant institutions were escalated to a regional level, where the significant institutions were unpacked in terms of their background, their mandate, focus areas and alignment with regional and continental frameworks and strategies, with recommendations provided (Refer to Section 17)

13.3.1 Literature review
To initiate the project, a literature review was undertaken which comprised a desk-top study to preliminary identify institutions that support the water, sanitation and related sectors within African countries. This preliminary assessment included the identification of African continental institutions and institutions beyond Africa. The organisations were grouped into various categories (Refer to Annexure-A for the current list, which will continue to be updated as new data becomes available):

- Research and Innovation Units
- Programmes and Networks
- Societies, associations and academies
- International Organisations
- Regional and Continental Bodies
- Funding Partners
  - Government
  - Domestic Science/Research Councils
  - International Science/Research Councils
  - Philanthropy
  - Financial Institutions
  - Universities

It is acknowledged that some overlap could occur among the categories. However, this did not detract from the main aim which was to undertake an initial literature review to identify institutions.

No assessment of the significance of the institutions was made at this stage nor a detailed description such as the background, mandate etc, as the main aim was to undertake a preliminary identification of institutions.

It was also decided, as previously mentioned, to utilise the Web of Science category of Water Resources to begin the preliminary search as defined by Pouris (2013).

13.3.2 Bibliometric study
The bibliometric data was based on the publication and affiliation data obtained from the Web of Science citation database and provided information for the country profiles. To obtain an overview of the water research in the respective countries, information such as the number of water research publications per country, the percentage of water research compared with other research, the predominant institutions...
responsible to produce water research and predominant funding agencies were provided. Moreover, the number of water research publications was normalised as publications per million population in the respective countries – this enabled relative comparisons between countries.

For each African country, a country profile was created which further highlight information from the bibliometric study and predominant enabling institutions, with information from the online survey and interviews (Refer to Section 14).

13.3.3 Survey

An online survey was developed with the approval of the Stellenbosch University Ethics Committee to commence with the survey (Refer to Annexure C for detail). As part of the development stages of the survey instrument, draft questions were created to obtain information based on the Terms of Reference for the project. Following an initial test stage, the online survey was launched on 15 September 2021, and accessible from the following web link: http://nepadwatercoe.org/research/watsanet/. The survey closed at the end of October 2021, to provide sufficient time for contributions.

Requests for participation in the survey were communicated via various channels which include WhatsApp, Linkedin and direct emails to various digital communities related to the African water, sanitation and related sectors. In addition, a formal request was made to the African Ministers’ Council for Water (AMCOW) to facilitate the participation of member states and River Basen Organisations through the various AMCOW Focal Points. Information on the survey was also sent to the contact partners in the AUDA-NEPAD Networks of Water Centres of Excellence.

By the end of October, the survey received 31 respondents. Follow-up reminders were sent throughout October to potentially increase participation. Given that the survey was only one of the instruments used in the project, the number of responses is not seen as a limitation in the project, and that the information supplemented the desktop assessments and interviews.

13.3.4 Data analysis and interviews

During the initial analysis stage of the project, researchers from other partners in the AUDA-NEPAD Networks of Water Centres of Excellence contributed more significantly and towards the review of data. This stage commenced in October 2021.

During the study, 18 key stakeholders were identified for interviews. Of these, 13 key stakeholder interviews were conducted in November, one could only provide feedback through email. The table below provides detail of the interviews.
The bibliometric and survey data analysis further informed which organisations to be interviewed (refer to Annexure E for more information on the draft interview schedule).
14 RESULTS: COUNTRY PROFILES

The purpose of this section was to identify the ‘lay of the land’ in terms of water research output in the African continent considering the timeframe of the data being 2010 to 2020 (refer to the Methodology section for a detailed description of the data). This was done in an attempt to find some indication of the level of support main role players contribute in terms of research output. This does not include other support such as programmatic support provided to governments, workshops to enable dialogues etc., which were reported through the survey and interviews.

To introduce the country profiles, Table 1 provides an overview of water research in the respective African countries. The table lists the various countries, with the number of publications along with water research publications normalised per million population to provide some comparison between different countries with varying resources. In addition, a comparison of water research as a share of total publications in the respective countries. Lastly, the predominant enablers supporting water research are indicated. Note that Section 14 only includes the top five/six enablers from Web of Science, whereas Annexure A is a more expanded list on role-players, according to the type of enabler. I.e. Section 14 includes many more enablers which will not be found under the country profiles.
Table 1: An overview of water research in African countries (2010 – 2020)

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population#</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Angola</td>
<td>6</td>
<td>0.213</td>
<td>0,54%</td>
<td>USAid, Benguela Current Commission, UNESCO, International Development Research Centre (Canada)</td>
</tr>
<tr>
<td>Republic of Botswana</td>
<td>131</td>
<td>59,614</td>
<td>2,34%</td>
<td>University of Botswana, Government of Botswana, European Commission, Water Utilities Corporation of Botswana, Alexander Von Humboldt Foundation, National Science Foundation (United States), USAid</td>
</tr>
<tr>
<td>Union of the Comoros</td>
<td>1</td>
<td>1,283</td>
<td>0,83%</td>
<td>UKAid, UKRI, French Development Agency, UPGro Grant (Natural Environment Research Council UK, now UKRI)</td>
</tr>
<tr>
<td>Kingdom of Eswatini</td>
<td>29</td>
<td>26,065</td>
<td>2,57%</td>
<td>Kolomela Mine*, Department of Science and Technology (India)<em>, Aware Foundation International</em>, Casa Barry Lodge*, Mintek (South Africa) <em>, Ministry of Education, Culture, Sports, Science and Technology (MEXT) (Japan)</em>, Israel Science Foundation*, Taiwan Government*, African Development Bank**, World Bank**, European Union**</td>
</tr>
<tr>
<td>Kingdom of Lesotho</td>
<td>14</td>
<td>6,767</td>
<td>2,16%</td>
<td>ACF Mongolia, ACF France</td>
</tr>
<tr>
<td>Republic</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
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<tr>
<td>Republic of Malawi</td>
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<tr>
<td>Republic of Mozambique</td>
<td>95</td>
<td>3,468</td>
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<td>Republic of Namibia</td>
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<td>44,363</td>
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<tr>
<td>Republic of South Africa</td>
<td>3142</td>
<td>55,613</td>
<td>1.40%</td>
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</tr>
</tbody>
</table>

- Lesotho Highlands Development Authority
- Consultative Group on International Agricultural Research (CGIAR)
- ACF International
- Norwegian Programme for Development, Research and Education
- UKRI
- Government of Malawi
- Natural Environment Research Council (now UK Research and Innovation (UKRI))
- Malawian Universities (Polytechnic, Strathclyde)
- European Commission
- Australian Centre for International Agricultural Research
- Lars Erik Lundberg Scholarship Foundation
- Swedish International Development Agency (SIDA)
- Consultative Group on International Agricultural Research (CGIAR)
- National Research Fund of Mozambique
- National Research Foundation (NRF) (South Africa)
- European Commission
- National Science Foundation
- German Federal Ministry of Education and Research
- Water Research Commission (WRC) (South Africa)
- Portuguese Foundation for Science and Technology
- National Research Foundation (South Africa)
- WRC (South Africa)
- CSIR (India)
- Natural Science Foundation of China
- UK Research and Innovation (UKRI)
- European Commission
- USAid
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<th>Country</th>
<th>Funding Credits</th>
<th>Total Credit</th>
<th>Percentage</th>
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<td>Bill and Melinda Gates Foundation*</td>
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<tr>
<td>GWP Southern Africa****</td>
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<tr>
<td>European Commission</td>
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<td>ESRC (Economic Social Research Council in the UK, also now UKRI)</td>
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<td>NERC (now UKRI)</td>
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<td>UK Research and Innovation (UKRI)</td>
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<tr>
<td>Royal Society of London</td>
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<tr>
<td>WaterNet</td>
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<tr>
<td>African Centre of Excellence in the Internet of Things</td>
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<tr>
<td>Republic of Zimbabwe</td>
<td>288</td>
<td>20,899</td>
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<tr>
<td>Australian Centre for International Agriculture Research*</td>
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<td>International Foundation for Science*</td>
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<tr>
<td>CGIAR*</td>
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<tr>
<td>European Commission* **</td>
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<tr>
<td>WaterNet Secretariat on Harare* ****</td>
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<td>UKAID**</td>
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<tr>
<td>Directorate-General for International Cooperation (DGIS)**</td>
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<td>International Association of Hydrological Sciences (IAHS)**</td>
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<tr>
<td>Republic of Burundi</td>
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<td>3,280</td>
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<tr>
<td>African Development Bank</td>
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<td>Japan Society for the Promotion of Science</td>
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<td>Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)</td>
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<td>Flemish Interuniversity Council (VLIR)</td>
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<tr>
<td>Republic of Cameroon</td>
<td>191</td>
<td>7,195</td>
<td>1.07%</td>
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<td>German Research Foundation (DFG)</td>
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<td>Country</td>
<td>Amount ($)</td>
<td>Percentage</td>
<td>Funders</td>
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<td>---------------------------------</td>
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| Central African Republic        | 1,449      | 0.33%      | • Department for International Development (DFID)  
• French Embassy in the Central African Republic  
• Canada's International Development Research  
• Academy of Science of the Czech Republic  
• PAPAVER-Centre for Human and Plant Studies in Europe and Northern Africa in the postglacial period  
• Univerzita Karlova v Praze |
| Republic of Chad                | 15,037     | 1.02%      | • United States Department of Agriculture (USDA)  
• National Science Foundation (NSF)  
• The United States Environmental Protection Agency  
• Natural Sciences and Engineering Research Council of Canada (NSERC)  
• United States Geological Survey (USGS)  
• Bureau of Reclamation |
| Congo Republic                  | 10,692     | 0.92%      | • European Commission  
• Swiss National Science Foundation (SNSF)  
• Belgian Technical Cooperation (BTC)  
• United States Agency for International Development (USAID)  
• National Natural Science Foundation of China (NSFC) |
| Democratic Republic of Congo    | 0,648      | 1.10%      | • European Commission  
• Swiss National Science Foundation  
• Natural Science Foundation of China  
• Belgian Technical Cooperation  
• CAS Western Light  
• Flanders Research Foundation (FWO)  
• African Development Bank (AfDB) |
| Republic of Equatorial Guinea   | 1,426      | 0.31%      | • Federal Ministry of Education Research |
| Gabonese Republic               | 4,493      | 0.32%      | • African Monsoon Multidisciplinary Analysis (AMMA)  
• French National Research Agency |
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<th>Donor Name</th>
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<th>Donor Name</th>
<th>Donor Code</th>
<th>Donor Name</th>
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<td>Mava Foundation</td>
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<td>AMEDE (Analyse Multi-Echelle de la Dynamique Eolienne au Sahel)</td>
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<td>OMARD tasks (Organic Marker Dynamics in tropical terrestrial environments)</td>
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<td>California Academy of Sciences</td>
<td>12,146</td>
<td>Coordenacao De Aperfeicoamento de Pessoal de Nivel Superior Capes</td>
<td>2.22%</td>
<td>Fundacao Calouste Gulbenkian Portugal</td>
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<td>Ministry of Public Works Infrastructures Natural Resources and Environment Mopirnao of The Democratic Republic of Sao Tome and Principe</td>
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<td>Centre d'Etude et de Recherche de Djibouti (CERD)</td>
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<td>King Saud University</td>
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<td>Mawani Project</td>
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<td>King Saud University</td>
<td></td>
<td>Ministere de l'Habitat, de l'Urbanisme</td>
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<td>Thailand International Cooperation Agency (TICA)</td>
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<td>China Scholarship Council</td>
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<td>University of Bern</td>
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<td>Country</td>
<td>Number</td>
<td>Contributions</td>
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<td>---------------------------------------------------------</td>
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</tbody>
</table>
| Republic of Madagascar        | 29     | Consultative Group on International Agricultural Research (CGIAR)  
|                               |        | South Africa Water Research Commission (WRC)  
|                               |        | Western Indian Ocean Marine Science Association (WIOMSA) |
| Republic of Mauritius         | 13     | French National Research Agency  
|                               |        | Qing Lan Project Foundation  
|                               |        | Bill and Melinda Gates Foundation  
|                               |        | Aird CIRAD (French agricultural research and cooperation organization)  
|                               |        | Blue Ventures  
| Republic of Rwanda            | 88     | Mauritian Research Council  
|                               |        | Government of Mauritius (Ministries of Agriculture, Environment and Sustainable Development, Tertiary Education and Municipality of Port Louis)  
|                               |        | European Commission  
|                               |        | Mauritian Wildlife Foundation  
|                               |        | Finnish Funding Agency for Technology Innovation  
| Republic of Seychelles        | 6      | Chinese Academy of Sciences  
|                               |        | National Basic Research Program of China  
|                               |        | Netherlands Government  
|                               |        | European Commission  
|                               |        | National Natural Science Foundation of China (NSFC)  
| Federal Republic of Somalia   | 21     | African Coelacanth Ecosystem Program  
|                               |        | Australian Research Council  
|                               |        | Global Finprint Project  
|                               |        | Government of Seychelles  
|                               |        | Isimangaliso Wetland Park  
|                               |        | European Commission  
|                               |        | Natural Environmental Research Council (NERC)  
|                               |        | National Aeronautics Space Administration (NASA)  
|                               |        | Natural Science Foundation  

Final Report (28 February 2022)
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<th>Country</th>
<th>Number</th>
<th>Funding</th>
<th>Percentage</th>
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<td>269</td>
<td>6,135</td>
<td>1.71%</td>
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<tr>
<td>Republic of South Sudan</td>
<td>50</td>
<td>4,467</td>
<td>1.54%</td>
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<tr>
<td>United Republic of Tanzania</td>
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<td>Republic of Uganda</td>
<td>344</td>
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<td>1.31%</td>
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</table>

- Fundamental Research Funds to the Central Universities
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- Netherlands Organisation for International Cooperation in Higher Education (NUFFIC)
- National Natural Science Foundation of China (NSFC)
- German Academic Exchange Service (DAAD)
- Netherlands Organization for Scientific Research (NWO)
- United States Agency for International Development (USAID)*
- United States Geological Survey (USGS)
- Curtin University
- Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)
- Japan International Cooperation Agency (JICA) **
- Dutch Government**
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**
- African Development Bank (AfDB)**
- World Bank**
- Department for International Development (DFID)**
- Skills Development Corporation (SDC)**
- Agence Française de Développement (AFD)**
- KfW Development Bank**
- Centre for Water Resource Research (CWRR)
- UKRI
- German Academic Exchange Service (DAAD)
- Natural Environment Research Council (the UK, now UKRI)
- USAid
- CGIAR
- Flemish Interuniversity Council (VLIR)
<table>
<thead>
<tr>
<th>Country</th>
<th>Projects</th>
<th>Grants (€)</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>People's Democratic Republic of Algeria</td>
<td>405</td>
<td>9,240</td>
<td>1,84%</td>
</tr>
<tr>
<td>Arab Republic of Egypt</td>
<td>2352</td>
<td>22,983</td>
<td>1,18%</td>
</tr>
<tr>
<td>State of Libya</td>
<td>40</td>
<td>5,820</td>
<td>1,30%</td>
</tr>
<tr>
<td>Islamic Republic of Mauritania</td>
<td>5</td>
<td>1,080</td>
<td>2,33%</td>
</tr>
<tr>
<td>Kingdom of Morocco</td>
<td>428</td>
<td>1,160</td>
<td>1,55%</td>
</tr>
</tbody>
</table>

- Netherlands Government**
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- Swedish International Development Agency (SIDA)
- Department for International Development (DFID)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**
- Bill and Melinda Gates Foundation
- French National Research Agency
- African Union Commission
- National Natural Science Foundation of China
- Alexander Von Humboldt Foundation
- Australian Research Council
- Science and Technology Development Fund
- Deanship of Scientific Research (King Saud University)
- National Science Foundation (NSF)
- Deanship of Scientific Research (King Abdulaziz University)
- Ministry of Higher Education Scientific Research (MHESR)
- European Commission
- Libyan Ministry of Higher Education
- Libyan Government of Higher Education and Scientific Research
- Science and Technology Development Fund
- Sirt University Libya
- University Kebangsaan Malaysia
- French National Research Agency
- Portuguese Foundation for Science and Technology
- European Commission
- Centre National d’Etudes Spatiales
- International Atomic Energy Agency (IAEA)
<table>
<thead>
<tr>
<th>Sahrawi Arab Democratic Republic</th>
<th>0</th>
<th>0,000</th>
<th>0%</th>
<th>•</th>
</tr>
</thead>
</table>
| Republic of Tunisia             | 460 | 3,890 | 1,56% | • European Commission  
|                                 |     |       |     | French National Research Agency  
|                                 |     |       |     | United States Agency for International Development (USAID)  
|                                 |     |       |     | Centre National d'Etudes Spatiales  
|                                 |     |       |     | Centre National de la Recherche Scientifique  
| Republic of Benin               | 93 | 7,670 | 2,40% | • Federal Ministry of Education Research  
|                                 |     |       |     | International Foundation for Science  
|                                 |     |       |     | Ministry of Agriculture Forestry, Forestries Japan  
|                                 |     |       |     | European Commission  
|                                 |     |       |     | Action Contre la Faim Collaborative Project*  
|                                 |     |       |     | Ambassade de Pays-Bas (Embassy of the Netherlands) (Programme OmiDelta)**  
|                                 |     |       |     | ProSEHA – GIZ**  
|                                 |     |       |     | Banque Mondiale (World Bank) **  
| Burkina Faso                   | 116 | 5,550 | 2,24% | • Federal Ministry of Education Research  
|                                 |     |       |     | European Commission  
|                                 |     |       |     | Bill and Melinda Gates Foundation  
|                                 |     |       |     | International Fund for Agricultural Development  
|                                 |     |       |     | Swiss Agency for Development and Cooperation  
| Republic of Cabo Verde         | 9  | 1,620 | 2,9% | • European Commission  
|                                 |     |       |     | Portuguese Foundation for Science and Technology  
|                                 |     |       |     | Aga Khan Development Network  
| Republic of Côte d’Ivoire      | 41 | 1,550 | 1,19% | • Bill and Melinda Gates Foundation  
|                                 |     |       |     | Centre Suisse de Recherches Scientifiques en Côte d’Ivoire  
|                                 |     |       |     | European Union  
|                                 |     |       |     | Federal Ministry of Education Research  
|                                 |     |       |     | Institut de Recherche pour le Development  
|                                 |     |       |     | Consultative Group on International Agricultural Research (CGIAR)  

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| Republic of the Gambia | 8  | 3,310 | 0,15% | Federal Ministry of Education Research  
| Republic of Ghana | 296 | 9,530 | 2,07% | Federal Ministry of Education Research  
| Republic of Guinea-Bissau | 0  | 0     | 0%    | European Commission  
| Republic of Guinea | 6  | 4,570 | 0,62% | Centre for International Forestry  
| Republic of Liberia | 3  | 5,930 | 0,29% | Federal Ministry of Education Research  
| Republic of Mali | 51 | 2,520 | 1,41% | Federal Ministry of Education Research  
| Republic of Niger | 47 | 1,940 | 4,13% | Federal Ministry of Education Research  
| Federal Republic of Nigeria | 538 | 2,610 | 1,35% | Federal Ministry of Education Research  
<p>| | | | | National Natural Science Foundation of China |</p>
<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
<th>Population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Senegal</td>
<td>89</td>
<td>5,310</td>
<td>1.45%</td>
</tr>
<tr>
<td>Republic of Sierra Leone</td>
<td>12</td>
<td>1,500</td>
<td>0.99%</td>
</tr>
<tr>
<td>Togolese Republic</td>
<td>7</td>
<td>8,460</td>
<td>1.22%</td>
</tr>
</tbody>
</table>

* Source: Web of Science.
#Calculated based on demographical data obtained from [www.worldometers.info](http://www.worldometers.info).
** Source: Survey

Detailed country profiles are provided in the following section.
Country profile: Republic of Angola

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
<th>Water research as a % of the total publications of Angola</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>0,21 publications per million</td>
<td>0,54%</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Benguela Current Commission
- Department of Meteorological Services (Botswana)
- Gobabeb Training and Research Centre
- INAMET (Angola) (Weather Service)
- Ministry of Fisheries and Marine Resources (Namibia)

Research focus areas in water resources:
- Environmental Sciences
- Geosciences Multidisciplinary
- Engineering Civil
- Oceanography

Enablers*:

Top funding agencies:
- USAid
- Benguela Current Commission
- UNESCO
- International Development Research Centre (Canada)

Synopsis

Funding is primarily international in scope, with a mix of multilateral, research and development funding. The publication affiliations are largely a mix of domestic and regional role-players as tertiary institutions, government ministries and other bodies.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Botswana

**Research output***

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>131</th>
<th>Water research as a % of the total publications of Botswana</th>
<th>2,34%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>59,61 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Publishing institutions and water research focus areas***

**Top publishing institutions for water research:**
- University of Botswana
- Botswana International University of Science and Technology
- University of Zimbabwe
- University of Malawi
- Botswana Institute of Technology Research and Innovation

**Research focus areas in water resources:**
- Geosciences Multidisciplinary
- Meteorology Atmospheric Sciences
- Environmental Sciences
- Engineering Civil
- Ecology and Engineering Environmental (tied)

**Enablers***

**Top funding agencies:**
- University of Botswana
- Government of Botswana
- European Commission
- Water Utilities Corporation of Botswana
- Alexander Von Humboldt Foundation
- National Science Foundation (United States)
- USAid

**Synopsis**

Research funding in water resources appears to be a good mix of domestic and international funding. The publications are also predominantly affiliated with local universities, with some collaboration regionally.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
### Country profile: Union of Comoros

#### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>1</th>
<th>Water research as a % of the total publications of Comoros</th>
<th>0.83%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1,28</td>
<td>publications per million</td>
<td></td>
</tr>
</tbody>
</table>

#### Publishing institutions and water research focus areas*

- Top publishing institutions for water research: University of Comoros
- Research focus areas in water resources: N/A

#### Enablers*

- Top funding agencies: UKAid, UKRI, French Development Agency, UPGro Grant (Natural Environment Research Council UK, now UKRI)

#### Synopsis

Very small research contribution on the Web of Science. The research publication is funded by international institutions with links to international researchers.

*Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info*
Country profile: Kingdom of Eswatini

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>29</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Eswatini</td>
<td>2.57%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>26.07 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- The University of Swaziland (now University of Eswatini)
- Ministry of Agriculture
- University of South Africa
- University of the Free State
- University of Johannesburg
- National Chung Hsing University

**Research focus areas in water resources:**
- Meteorology Atmospheric Sciences
- Environmental Sciences
- Geosciences Multidisciplinary
- Engineering Chemical
- Engineering Environmental

Enablers*

**Top agencies:**
- Kolomela Mine*
- Department of Science and Technology (India)*
- Aware Foundation International*
- Casa Barry Lodge*
- Mintek (South Africa) *
- Ministry of Education, Culture, Sports, Science and Technology (MEXT) (Japan)*
- Israel Science Foundation*
- Taiwan Government*
- Government of Eswatini**
- African Development Bank**
- World Bank**
- European Union**

Synopsis

Funding is predominantly international, with numerous regional and global funding bodies, mostly from Asia, Europe and the rest of the continent with some local government and industry funding. Publication affiliations are largely a mix of domestic and regional (South Africa) with one Asian institution, which could be closely linked to the funding source of Taiwan.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Kingdom of Lesotho

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>14</th>
<th>Water research as a % of the total publications of Lesotho</th>
<th>2,16%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>6,77 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- National University of Lesotho
- University of KwaZulu Natal
- University of the Western Cape
- University of Science and Technology Beijing
- Technologies for Economic Development (NGO in Lesotho)

Research focus areas in water resources:
- Geosciences Multidisciplinary
- Environmental Sciences
- Meteorology Atmospheric Sciences
- Soil Science
- Engineering Environmental

Enablers*

Top funding agencies:
- ACF Mongolia
- ACF France
- Lesotho Highlands Development Authority
- Consultative Group on International Agricultural Research (CGIAR)
- ACF International

Synopsis

Funding is largely international with some local funding. Publication affiliations are largely domestic and regional, with some international partnerships beyond Southern Africa.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Malawi

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>165</th>
<th>Water research as a % of the total publications of Malawi</th>
<th>2,06%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>9,80 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- University of Malawi
- Mzuzu University
- University of Strathclyde
- University of Zimbabwe
- University of Botswana

**Research focus areas in water resources:**
- Geosciences Multidisciplinary
- Meteorology Atmospheric Sciences
- Environmental Sciences
- Engineering Environment
- Ecology

Enablers*

**Top funding agencies:**
- Norwegian Programme for Development, Research and Education
- UKRI
- Government of Malawi
- Natural Environment Research Council (Now UKRI)
- Malawian Universities (Polytechnic, Strathclyde)

Synopsis

Funding is a mix between international and domestic sources, with domestic largely government and international largely research councils. Publication affiliation on the other hand is largely domestic and regional tertiary institutions.

The University of Malawi is a member of the AUDA-NEPAD Southern African Network Centre for Excellence in Water

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Mozambique

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Mozambique</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>2.07%</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 4.47 publications per million |

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- Eduardo Mondlane University
- Lund University
- CIRAD (French agricultural research and cooperation organization)
- IHE Delft Institute for Water Education
- Consultative Group on International Agricultural Research (CGIAR)

**Research focus areas in water resources:**
- Geosciences Multidisciplinary
- Meteorology Atmospheric Sciences
- Environmental Sciences
- Oceanography
- Agronomy

### Enablers*

**Top funding agencies:**
- European Commission
- Australian Centre for International Agricultural Research
- Lars Erik Lundberg Scholarship Foundation
- Swedish International Development Agency (SIDA)
- Consultative Group on International Agricultural Research (CGIAR)
- National Research Fund of Mozambique

### Synopsis

At first glance, the funding is predominantly international, largely from Europe and Australia, with some funding from domestic sources. The publication affiliations are mixed between domestic and international institutions, with Eduardo Mondlane being the most predominant.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Namibia

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>94</th>
<th>Water research as a % of the total publications of Namibia</th>
<th>2,81%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>44,36 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- University of Namibia
- University of the Western Cape
- Namibia University of Science and Technology
- University of Zimbabwe
- Stellenbosch University

Research focus areas in water resources:
- Geosciences Multidisciplinary
- Meteorology Atmospheric Sciences
- Environmental Sciences
- Engineering Environmental
- Engineering Civil

Enablers*

Top funding agencies:
- National Research Foundation (NRF) (South Africa)
- European Commission
- National Science Foundation
- German Federal Ministry of Education and Research
- Water Research Commission (WRC) (South Africa)
- Portuguese Foundation for Science and Technology

Synopsis

At first glance, the funding streams are dominated by regional (South Africa) and international sources from Europe. The publication affiliations on the other hand are largely Namibian institutions with some regional players within SADC.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of South Africa

<table>
<thead>
<tr>
<th>Research output*</th>
<th>3 142</th>
<th>Water research as a % of the total publications of South Africa</th>
<th>1.40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>55.61</td>
<td>publications per million</td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

<table>
<thead>
<tr>
<th>Top publishing institutions for water research:</th>
<th>University of KwaZulu Natal</th>
<th>University of Johannesburg</th>
<th>University of Witwatersrand</th>
<th>University of Cape Town</th>
<th>University of Pretoria</th>
<th>Rhodes University</th>
<th>Stellenbosch University</th>
<th>Council of Scientific and Industrial Research (CSIR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research focus areas in water resources:</td>
<td>Environmental Sciences</td>
<td>Geosciences Multidisciplinary</td>
<td>Meteorology Atmospheric Sciences</td>
<td>Engineering Environmental</td>
<td>Engineering Civil</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enablers

| Top funding agencies: | National Research Foundation (South Africa) * ** | WRC (South Africa) * ** | CSIR (India)* | Natural Science Foundation of China* | UKRI* | European Commission* ** | USAID* | Bill and Melinda Gates Foundation* | Global Water Partnership (GWP) Southern Africa**** |

Synopsis

South Africa produces, by far, the most water research in the Southern African region, with local finding agencies such as the Water Research Commission and National Research Foundation creating and enabling an environment for research to be undertaken. In addition to the local agencies, other BRICS countries such as India and China further contribute towards water research in South Africa, along with research funding agencies in the Global North such as the UKRI, European Commission USAID and also the Bill and Melinda Gates Foundation.

GWP, although a secretariat office in South Africa, have a regional/continental mandate.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Zambia

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>42</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Zambia</td>
<td>0.73%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>3.09 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>• University of Zambia</td>
</tr>
<tr>
<td>• Natural Environment Research Council (the UK, now UKRI)</td>
</tr>
<tr>
<td>• British Geological Survey</td>
</tr>
<tr>
<td>• UKRI</td>
</tr>
<tr>
<td>• Copperbelt University</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>• Environmental Sciences</td>
</tr>
<tr>
<td>• Geosciences Multidisciplinary</td>
</tr>
<tr>
<td>• Engineering Environmental</td>
</tr>
<tr>
<td>• Meteorology Atmospheric Sciences</td>
</tr>
<tr>
<td>• Public Environmental Occupational Health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>• European Commission</td>
</tr>
<tr>
<td>• ESRC (Economic Social Research Council in the UK, also now UKRI)</td>
</tr>
<tr>
<td>• NERC (now UKRI)</td>
</tr>
<tr>
<td>• UK Research and Innovation (UKRI)</td>
</tr>
<tr>
<td>• Royal Society of London</td>
</tr>
<tr>
<td>• WaterNet</td>
</tr>
<tr>
<td>• African Centre of Excellence in the Internet of Things</td>
</tr>
</tbody>
</table>

Synopsis

Funding is mainly international, with some continental funding. Publication affiliation on the other hand is a mix between domestic and international. The international funding and publication affiliations are predominantly from the UK.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
**Country profile: Republic of Zimbabwe**

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>288</th>
<th>Water research as a % of the total publications of Zimbabwe</th>
<th>3.75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>20,90 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

#### Top publishing institutions for water research:
- University of Zimbabwe
- Consultative Group on International Agricultural Research (CGIAR)
- Chinhoyi University of Technology
- University of the Western Cape
- Bindura University of Science Education

#### Research focus areas in water resources:
- Geosciences Multidisciplinary
- Meteorology Atmospheric Services
- Environmental Sciences
- Engineering Environmental
- Agronomy

### Enablers*

#### Top funding agencies:
- Australian Centre for International Agriculture Research*
- International Foundation for Science*
- Consultative Group on International Agricultural Research (CGIAR)*
- European Commission**
- WaterNet*
- UKAID**
- Directorate-General for International Cooperation (DGIS)**
- International Association of Hydrological Sciences (IAHS)**
- WaterNet Secretariat in Harare****

### Synopsis

Funding is largely derived from international sources, with the publication association being a mix of domestic, regional and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from [www.worldometers.info](http://www.worldometers.info); ***** literature review
Country profile: Republic of Burundi

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of Burundi</td>
<td>2.58%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>3.28 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- University of Burundi
- Ege University
- Ghent University
- Lake Tanganyika Authority
- Food Agriculture Organization (FAO)

Research focus areas in water resources:
- Water Resources
- Environmental Sciences Ecology
- Engineering
- Marine Freshwater Biology
- Geology

Enablers*

Top funding agencies:
- Turkish Scientific and Technical Research Council (TUBITAK)
- European Commission
- African Development Bank
- Japan Society for the Promotion of Science
- Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)
- Flemish Interuniversity Council (VLIR)

Synopsis

Research funding appears to be predominantly international, with a spread between Europe, Asia and Africa. Publication Affiliations on the other hand are a balanced mix between domestic and international sources.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Cameroon

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Cameroon</th>
</tr>
</thead>
<tbody>
<tr>
<td>191</td>
<td>1.07%</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 7.20 publications per million |

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- University of Yaounde
- National Centre for Scientific Research (CNRS)
- University of Douala
- University of Buea
- University of Dschang

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Geology
- Engineering
- Meteorology Atmospheric Sciences

### Enablers*

**Top funding agencies:**
- Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)
- European Commission
- German Research Foundation (DFG)
- Japan Society for the Promotion of Science
- French Institute of Research for Development (IRD)
- The PAU Institute for Governance, Humanities and Social Sciences, PAUGHSS is hosted at the University of Yaoundé II, and The Pan African Virtual and E- University (PAVEU)****

### Synopsis

Funding appears to be predominantly international, with Japan and Europe main sources. Publication affiliation on the other hand is predominantly local.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from [www.worldometers.info](http://www.worldometers.info) ****
Country profile: Central African Republic

**Research output***

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>7</th>
<th>Water research as a % of the total publications of Central African Republic</th>
<th>0,33%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1.45 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Publishing institutions and water research focus areas***

**Top publishing institutions for water research:**
- National Centre for Scientific Research (CNRS)
- University of Bangui
- Research Institute for Development (Institut de recherche pour le développement)
- University of Montpellier
- French National Research Institute for Agriculture (INRAE)

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Engineering
- Agriculture
- Geology

**Enablers***

**Top funding agencies:**
- Department for International Development (DFID)
- French Embassy in the Central African Republic
- Canada's International Development Research
- Academy of Science of the Czech Republic
- PAPAVER-Centre for Human and Plant Studies in Europe and Northern Africa in the postglacial period
- Univerzita Karlova v Praze

**Synopsis**

Funding primarily appears to come from international sources, with Europe a major source. The publication affiliations are similarly concentrated in Europe with some local institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Chad

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>247</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Chad</td>
<td>1.02%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>15.04 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>• University of California</td>
</tr>
<tr>
<td>• Centre National de la Recherche Scientifique (CNRS)</td>
</tr>
<tr>
<td>• Texas A&amp;M University</td>
</tr>
<tr>
<td>• United States Army</td>
</tr>
<tr>
<td>• State University of New York</td>
</tr>
<tr>
<td>• University of Missouri</td>
</tr>
<tr>
<td>• Purdue University</td>
</tr>
<tr>
<td>• United States Department of Agriculture (USDA)</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>• Water Resources</td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
</tr>
<tr>
<td>• Engineering</td>
</tr>
<tr>
<td>• Geology</td>
</tr>
<tr>
<td>• Agriculture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>• United States Department of Agriculture (USDA)</td>
</tr>
<tr>
<td>• National Science Foundation (NSF)</td>
</tr>
<tr>
<td>• The United States Environmental Protection Agency</td>
</tr>
<tr>
<td>• Natural Sciences and Engineering Research Council of Canada (NSERC)</td>
</tr>
<tr>
<td>• United States Geological Survey (USGS)</td>
</tr>
<tr>
<td>• Bureau of Reclamation</td>
</tr>
</tbody>
</table>

Synopsis

Funding is predominantly international, with the US and the UK as contributors. The publication affiliation is similarly based in the US with some in Europe.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
### Country profile: Congo Republic

#### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Congo Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>0.92%</td>
</tr>
</tbody>
</table>

Water research publications per million of the population: †

| 10.69 publications per million |

#### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- Royal Museum for Central Africa
- University of Liege
- French Institute of Research for Development (IRD)
- University of Lubumbashi
- Marien Ngouabi University

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Geology
- Marine Freshwater Biology
- Engineering

#### Enablers*

**Top funding agencies:**
- European Commission
- Swiss National Science Foundation (SNSF)
- Belgian Technical Cooperation (BTC)
- United States Agency for International Development (USAID)
- National Natural Science Foundation of China (NSFC)

#### Synopsis

Funding is largely international with a spread between Europe, the US and Asia. The publication affiliations are a mix between domestic and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Democratic Republic of Congo

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of Water Research publications</td>
<td>52</td>
</tr>
<tr>
<td>Water research as a % of the total publications of the Democratic Republic of Congo</td>
<td>1,10%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>0,65 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>• University of Kinshasa</td>
</tr>
<tr>
<td>• Royal Museum for Central Africa</td>
</tr>
<tr>
<td>• University of Lubumbashi</td>
</tr>
<tr>
<td>• University of Liege</td>
</tr>
<tr>
<td>• Ghent University</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>• Environmental Sciences</td>
</tr>
<tr>
<td>• Geosciences Multidisciplinary</td>
</tr>
<tr>
<td>• Meteorology Atmospheric Sciences</td>
</tr>
<tr>
<td>• Marine Freshwater Biology</td>
</tr>
<tr>
<td>• Soil Science</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>• European Commission</td>
</tr>
<tr>
<td>• Swiss National Science Foundation</td>
</tr>
<tr>
<td>• Natural Science Foundation of China</td>
</tr>
<tr>
<td>• Belgian Technical Cooperation</td>
</tr>
<tr>
<td>• CAS Western Light</td>
</tr>
<tr>
<td>• FWO (Flanders Research Foundation)</td>
</tr>
<tr>
<td>• African Development Bank (AfDB)</td>
</tr>
</tbody>
</table>

Synopsis

At first glance, the funding is predominantly international, with European nations and China providing funding, with the African Development Bank also being a contributor. The publication affiliations are largely mixed between domestic and international institutions, mainly between the Democratic Republic of Congo and European institutions, including a national institution such as the Royal Museum for Central Africa.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Equatorial Guinea

**Research output**

<table>
<thead>
<tr>
<th>Nr of water research publications</th>
<th>Water research as a % of the total publications of Equatorial Guinea</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0,31 %</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 1,43 publications per million |

**Publishing institutions and water research focus areas**

**Top publishing institutions for water research:**
- Leibniz Zentrum fur Marine Tropenforschung (ZMT)
- Pacific Community
- United Nations Development Programme (UNDP)
- University of Kiel
- Utrecht University

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Geology
- Marine Freshwater Biology
- Meteorology Atmospheric Sciences

**Enablers**

**Top funding agencies:**
- Federal Ministry of Education Research

**Synopsis**

Research funding in water resources appears to be a good mix of domestic and international funding. The publications appear largely affiliated internationally.

Data sources: *WoS; **Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Gabonese Republic

<table>
<thead>
<tr>
<th>Research output*</th>
<th>Water research as a % of the total publications of Gabon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>10</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>4,49 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>• Centre national de la recherche scientifique (CNRS) French National Centre for Scientific Research</td>
</tr>
<tr>
<td>• Institut de Recherche pour le Développement (IRD) - National Research Institute for Sustainable Development</td>
</tr>
<tr>
<td>• University of Toulouse</td>
</tr>
<tr>
<td>• Institut National Polytechnique</td>
</tr>
<tr>
<td>• 2iE - Institut International d'Ingénierie de l'Eau et de l'Environnement</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>• Water Resources</td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
</tr>
<tr>
<td>• Geology</td>
</tr>
<tr>
<td>• Engineering</td>
</tr>
<tr>
<td>• Marine Freshwater Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>• African Monsoon Multidisciplinary Analysis (AMMA)</td>
</tr>
<tr>
<td>• French National Research Agency</td>
</tr>
<tr>
<td>• Mava Foundation</td>
</tr>
<tr>
<td>• AMEDE (Analyse Multi-Echelle de la Dynamique Eolienne au Sahel)</td>
</tr>
<tr>
<td>• OMARD tasks (Organic Marker Dynamics in tropical terrestrial environments)</td>
</tr>
</tbody>
</table>

Synopsis
Funding is predominantly continental and international, with publication affiliation largely international.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Democratic Republic of São Tomé and Príncipe

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of São Tomé and Príncipe</td>
<td>1,05 %</td>
</tr>
<tr>
<td>Water research publications per million of the population. †</td>
<td>13,69 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:

- Delft University of Technology*
- Instituto Gulbenkian de Ciência (IGC)
- James Cook University
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- University of São Tomé and Príncipe
- University of Las Palmas de Gran Canaria
- Federal University of Santa Catarina-Universidade Federal de Santa Catarina (UFSC)
- Federal University of Santa Catarina-Universidade Federal de Santa Maria (UFSM)

Research focus areas in water resources:

- Water Resources
- Environmental Sciences Ecology
- Geology
- Meteorology Atmospheric Sciences
- Oceanography

Enablers*

Top funding agencies:

- California Academy of Sciences
- Coordenacao De Aperfeicoamento de Pessoal de Nivel Superior Capes
- Fundacao Calouste Gulbenkian Portugal
- Ministry of Public Works Infrastructures Natural Resources and Environment Mopirnao of The Democratic Republic of São Tomé and Príncipe
- Rufford Foundation
- World Bank Programme West Africa Coastal Area (WACA) Management

Synopsis

Research funding in water resources appears to be largely international funding with some local sources. The publications are also mixed between domestic and international tertiary and multilateral institutions and domestic institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Djibouti

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>12</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>12,15 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
<td></td>
</tr>
<tr>
<td>• Centre d'Etude et de Recherche de Djibouti (CERD)</td>
<td></td>
</tr>
<tr>
<td>• National Centre for Scientific Research (CNRS)</td>
<td></td>
</tr>
<tr>
<td>• University of Poitiers</td>
<td></td>
</tr>
<tr>
<td>• Indiana University</td>
<td></td>
</tr>
<tr>
<td>o Indian Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
<td></td>
</tr>
<tr>
<td>• Water Resources</td>
<td></td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
<td></td>
</tr>
<tr>
<td>• Geology</td>
<td></td>
</tr>
<tr>
<td>• Engineering</td>
<td></td>
</tr>
<tr>
<td>• Oceanography</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
<td></td>
</tr>
<tr>
<td>• Centre d'Etude et de Recherche de Djibouti (CERD)</td>
<td></td>
</tr>
<tr>
<td>• King Saud University</td>
<td></td>
</tr>
<tr>
<td>• Mawari Project</td>
<td></td>
</tr>
<tr>
<td>o Ministère de l'Habitat, de l'Urbanisme</td>
<td></td>
</tr>
</tbody>
</table>

Synopsis

Funding appears to be a mix between domestic and international sources, with the publication affiliations to be the same, but with more institutions abroad.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: State of Eritrea

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr of water research publications</td>
<td>21</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Eritrea</td>
<td>1.69%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>5,92 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Eritrea Institute of Technology (EIT)
- IHE Delft Institute for Water Education
- Prince of Songkla University (PSU)
- Hamelmalo Agricultural College
- Sultan Qaboos University
- Asmara Mining Share Company
- MetaMeta
- Indian Institute of Technology

Research focus areas in water resources:
- Water Resources
- Engineering
- Agriculture
- Environmental Sciences Ecology
- Geology

Enablers*

Top funding agencies:
- Thailand International Cooperation Agency (TICA)
- University of Bern
- China Scholarship Council
- South African Water Research Commission (WRC)
- Netherlands Organisation for International Cooperation in Higher Education

Synopsis

Research funding appears to be predominantly international and continental, while the publication affiliations are a mix between domestic and international tertiary institutions and industry.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Federal Democratic Republic of Ethiopia

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr of water research publications</td>
<td>1020</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Ethiopia</td>
<td>2.89%</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 8.87 publications per million |

**Publishing institutions and water research focus areas***

**Top publishing institutions for water research:**
- Addis Ababa University
- Bahir Dar University
- Mekelle University
- The consortium of International Agricultural Research Centres (CGIR)
- International Water Management Institute (IWMI)
- IHE Delft Institute for Water Education
- State University System of Florida
- Florida International University

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Geology
- Engineering
- Agriculture

**Enablers***

**Top funding agencies:**
- United States Agency for International Development (USAID)
- European Commission
- Addis Ababa University
- International Foundation for Science
- National Science Foundation (NSF)

**Synopsis**

Research funding in water resources appears to be a balanced mix of domestic and international funding. The publications are also a mix between domestic and international institutions, predominantly from Europe and the US.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Kenya

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>679</th>
<th>Water research as a % of the total publications of Kenya</th>
<th>1,49%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>12,63 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- The consortium of International Agricultural Research Centres (CGIR)
- University of Nairobi
- Jomo Kenyata University of Agricultural Technology
- Egerton University
- IHE Delft Institute for Water Education

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Geology
- Engineering
- Marine Freshwater Biology

### Enablers*

**Top funding agencies:**
- Flemish Interuniversity Council (VLIR)
- Swedish International Development Agency (SIDA)
- Consultative Group on International Agricultural Research (CGIAR)
- South Africa Water Research Commission (WRC)
- Western Indian Ocean Marine Science Association (WIOMSA)
- IGAD (Member of AUDA-NEPAD SANWATCE)

### Synopsis

Research funding appears to be predominantly international, with publication affiliations balanced between domestic and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Madagascar

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Madagascar</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>0,80%</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 1,19 publications per million |

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- University of Antananarivo
- Institute de Recherche pour le Developpement (IRD)
- University of Toliara
- CIRAD (French agricultural research and cooperation organization)
- Blue Ventures Conservation

**Research focus areas in water resources:**
- Environmental Sciences
- Geosciences Multidisciplinary
- Oceanography
- Engineering Civil
- Computer Science Interdisciplinary Applications

### Enablers*

**Top funding agencies:**
- French National Research Agency
- Qing Lan Project Foundation
- Bill and Melinda Gates Foundation
- Aird Cirad (French agricultural research and cooperation organization)
- Blue Ventures

### Synopsis

Initial results point to funding being largely international, largely philanthropy and development funding, while the publication affiliation is also largely international, but the largest node domestically being the University of Antananarivo

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Mauritius

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Mauritius</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>0.45%</td>
</tr>
</tbody>
</table>

| Water research publications per million of the population: † | 10.31 publications per million |

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- University of Mauritius
- Association pour le développement durable Mauritius
- International Institute of Social Sciences
- Mauritian Wildlife Foundation
- Mauritius Sugarcane Industry Research Institute

**Research focus areas in water resources:**
- Geosciences Multidisciplinary
- Environmental Sciences
- Meteorology Atmospheric Sciences
- Oceanography
- Soil Science

### Enablers*

**Top funding agencies:**
- Mauritius Research Council
- Government of Mauritius (Ministries of Agriculture, Environment and Sustainable Development, Tertiary Education and Municipality of Port Louis)
- European Commission
- Mauritian Wildlife Foundation
- Finnish Funding Agency for Technology Innovation

### Synopsis

Funding is a mix of government, research and philanthropy, with it being a balanced mix of international and domestic funding. Publication affiliation is also a mix between domestic and international institutions, but most of it is domestic with a mix between tertiary institutions and industry research bodies.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Rwanda

### Research output*

<table>
<thead>
<tr>
<th>Nr of water research publications</th>
<th>88</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of Rwanda</td>
<td>1.18%</td>
</tr>
<tr>
<td>Water research publications per million of the population. †</td>
<td>6.79 publications per million</td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

#### Top publishing institutions for water research:
- Chinese Academy of Sciences
- University of Rwanda
- University of Lay Adventists Kigali (UNILAK)
- Water Sanitation Program
- IHE Delft Institute for Water Education

#### Research focus areas in water resources:
- Water Resources
- Public Environmental Occupational Health
- Environmental Sciences Ecology
- Public Administration
- Geology

### Enablers*

#### Top funding agencies:
- Chinese Academy of Sciences
- National Basic Research Program of China
- Netherlands Government
- European Commission
- National Natural Science Foundation of China (NSFC)

### Synopsis

Research funding appears to be predominantly international from Europe and China, while publication affiliations are largely mixed between domestic and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Seychelles

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>6</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Seychelles</td>
<td>0.90%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>63.79 publications per million</td>
</tr>
</tbody>
</table>

**Publishing institutions and water research focus areas**

**Top publishing institutions for water research:**
- Australian Institute of Marine Science
- Ezemvelo KZN Wildlife
- James Cook University
- John Hopkins University

**Research focus areas in water resources:**
- Oceanography
- Environmental Sciences
- Marine Freshwater Biology
- Engineering Civil
- Statistics Probability

**Enablers**

**Top funding agencies:**
- African Coelacanth Ecosystem Program
- Australian Research Council
- Global Finprint Project
- Government of Seychelles
- Isimangaliso Wetland Park

**Synopsis**

At first glance, Seychelles is largely funded by international institutions, including NGOs and environmental bodies, with some government funding. The publication affiliations on the other hand are international entities on the Web of Science.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Federal Republic of Somalia

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>Water research as a % of the total publications of Somalia</th>
<th>0.92%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1,32 publications per million</td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- University of Colorado
- Food Agriculture Organization (FAO)
- Purdue University
- Chinese Science Academy
- University of Dar Es Salaam
- UK Centre for Ecology Hydrology (UKCEH)
- European Commission

**Research focus areas in water resources:**
- Water Resources
- Geology
- Meteorology Atmospheric Sciences
- Environmental Sciences Ecology
- Agriculture

### Enablers*

**Top funding agencies:**
- European Commission
- Natural Environmental Research Council (NERC)
- National Aeronautics Space Administration (NASA)
- Natural Science Foundation
- Fundamental Research Funds to the Central Universities

### Synopsis

Research funding in water resources appears to be largely international funding. The publications are associated mainly with international entities.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of the Sudan

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>269</th>
<th>Water research as a % of the total publications of Sudan</th>
<th>1.71%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>6,13 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- IHE Delft Institute for Water Education
- Delft University of Technology
- University of Khartoum
- Sudan University of Science and Technology
- Hydraulic Research Centre

**Research focus areas in water resources:**
- Water Resources
- Environmental Sciences Ecology
- Engineering
- Geology
- Agriculture

### Enablers*

**Top funding agencies:**
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- Netherlands Organisation for International Cooperation in Higher Education (NUFFIC)
- National Natural Science Foundation of China (NSFC)
- German Academic Exchange Service (DAAD)
- Netherlands Organization for Scientific Research (NWO)

### Synopsis

Research funding in water resources appears to be predominantly international funding with Netherlands-based agencies dominating. The publications are predominantly affiliated with local universities, with some collaboration regionally and internationally.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of South Sudan

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications</td>
<td>50</td>
</tr>
<tr>
<td>Water research as a % of the total publications of South Sudan</td>
<td>1,54%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>4,67 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>• State University of Florida</td>
</tr>
<tr>
<td>• Florida International University</td>
</tr>
<tr>
<td>• South Florida Water Management District</td>
</tr>
<tr>
<td>• United States Geological Survey (USGS)</td>
</tr>
<tr>
<td>• United States Department of the Interior</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>• Water Resources</td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
</tr>
<tr>
<td>• Engineering</td>
</tr>
<tr>
<td>• Geology</td>
</tr>
<tr>
<td>• Geography</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>• United States Agency for International Development (USAID)* **</td>
</tr>
<tr>
<td>• United States Geological Survey (USGS)</td>
</tr>
<tr>
<td>• Curtin University</td>
</tr>
<tr>
<td>• Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)</td>
</tr>
<tr>
<td>• Japan International Cooperation Agency (JICA)**</td>
</tr>
<tr>
<td>• Dutch Government**</td>
</tr>
<tr>
<td>• Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**</td>
</tr>
<tr>
<td>• African Development Bank (AfDB)**</td>
</tr>
<tr>
<td>• World Bank**</td>
</tr>
<tr>
<td>• Department for International Development (DFID)**</td>
</tr>
<tr>
<td>• Skills Development Corporation (SDC)**</td>
</tr>
<tr>
<td>• Agence Française de Développement (AFD)**</td>
</tr>
<tr>
<td>• KfW Development Bank**</td>
</tr>
<tr>
<td>• Centre for Water Resource Research (CWRR)</td>
</tr>
</tbody>
</table>

Synopsis
Research funding in water resources appears to be predominantly international funding. The publications are also predominantly international, based in the US.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Tanzania

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>326</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of Tanzania</td>
<td>1.90%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>7.40 publications per million</td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

#### Top publishing institutions for water research:
- University of Dar es Salaam
- Sokoine University of Agriculture
- Nelson Mandela African Institution of Science and Technology (Based in Arusha, Tanzania)
- Ardhi University
- IHE Delft Institute for Water Education

#### Research focus areas in water resources:
- Environmental Sciences
- Geosciences Multidisciplinary
- Meteorology Atmospheric Sciences
- Engineering Environmental
- Ecology

### Enablers*

#### Top funding agencies:
- UKRI
- German Academic Exchange Service (DAAD)
- Natural Environment Research Council (the UK, now UKRI)
- USAid
- Consultative Group on International Agricultural Research (CGIAR)

### Synopsis

Funding is international, with most of it being from Europe and the US from the various research councils and international development agencies. Publication affiliation on the other hand is largely domestic, with some international institutions as well.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Republic of Uganda

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications</th>
<th>344</th>
<th>Water research as a % of the total publications of Uganda</th>
<th>1,31%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>7,52 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Makerere University
- IHE Delft Institute for Water Education
- National Water and Sewerage Corporation (NWASC)
- KU Leuven
- Delft University of Technology

Research focus areas in water resources:
- Water Resources
- Environmental Sciences Ecology
- Geology
- Engineering
- Meteorology Atmospheric Sciences

Enablers*

Top funding agencies:
- Flemish Interuniversity Council (VLIR)
- Dutch Government**
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- Swedish International Development Agency (SIDA)
- Department for International Development (DFID)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**
- Bill and Melinda Gates Foundation

Synopsis

Research funding in water resources appears to be largely international funding. The publications are also mixed between domestic and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: People's Democratic Republic of Algeria

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>405</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>8,46 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

<table>
<thead>
<tr>
<th>Top publishing institutions for water research:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>University Science and Technology Houari Boumediene</td>
<td>Universite Badji Mokhtar Annaba</td>
</tr>
<tr>
<td>Centre National de la Recherche Scientifique (CNRS)</td>
<td>Universite Saad Dahlab de Blida</td>
</tr>
<tr>
<td>Universite de Bejaia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research focus areas in water resources:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Environmental Sciences Ecology</td>
</tr>
<tr>
<td>Geology</td>
<td>Agriculture</td>
</tr>
</tbody>
</table>

Enablers*

<table>
<thead>
<tr>
<th>Top funding agencies:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>French National Research Agency</td>
<td>African Union Commission</td>
</tr>
<tr>
<td>National Natural Science Foundation of China</td>
<td>Alexander Von Humboldt Foundation</td>
</tr>
<tr>
<td>Australian Research Council</td>
<td></td>
</tr>
</tbody>
</table>

Synopsis

To be completed.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country profile: Arab Republic of Egypt

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr of water research publications</td>
<td>2352</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>22.98 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
<td></td>
</tr>
<tr>
<td>• National Research Centre (NRC)</td>
<td></td>
</tr>
<tr>
<td>• Cairo University</td>
<td></td>
</tr>
<tr>
<td>• Alexandria University</td>
<td></td>
</tr>
<tr>
<td>• Mansoura University</td>
<td></td>
</tr>
<tr>
<td>• Tanta University</td>
<td></td>
</tr>
<tr>
<td>• King Saud University</td>
<td></td>
</tr>
<tr>
<td>• Zagazig University</td>
<td></td>
</tr>
<tr>
<td>• King Abdulaziz University</td>
<td></td>
</tr>
<tr>
<td>• Ain Shams University</td>
<td></td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
<td></td>
</tr>
<tr>
<td>• Water Resources</td>
<td></td>
</tr>
<tr>
<td>• Engineering</td>
<td></td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
<td></td>
</tr>
<tr>
<td>• Geology</td>
<td></td>
</tr>
<tr>
<td>• Agriculture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
<td></td>
</tr>
<tr>
<td>• Science and Technology Development Fund</td>
<td></td>
</tr>
<tr>
<td>• Deanship of Scientific Research (King Saud University)</td>
<td></td>
</tr>
<tr>
<td>• National Science Foundation (NSF)</td>
<td></td>
</tr>
<tr>
<td>• Deanship of Scientific Research (King Abdulaziz University)</td>
<td></td>
</tr>
<tr>
<td>• Ministry of Higher Education Scientific Research (MHESR)</td>
<td></td>
</tr>
<tr>
<td>• European Commission</td>
<td></td>
</tr>
</tbody>
</table>

Synopsis

Research funding in water resources appears to be a balanced mix of domestic and international funding. The publications are also predominantly affiliated with local universities, with some collaboration regionally.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: State of Libya

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr of water research publications:</td>
<td>40</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Libya</td>
<td>1.30%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>5.82 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

<table>
<thead>
<tr>
<th>Top publishing institutions for water research:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Az Zawiyah University</td>
</tr>
<tr>
<td>Ghent University</td>
</tr>
<tr>
<td>University of Sirte</td>
</tr>
<tr>
<td>Al Fateh University</td>
</tr>
<tr>
<td>Arab Potash Company</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research focus areas in water resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resources</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Environmental Sciences Ecology</td>
</tr>
<tr>
<td>Geology</td>
</tr>
</tbody>
</table>

Enablers*

<table>
<thead>
<tr>
<th>Top funding agencies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Libyan Ministry of Higher Education</td>
</tr>
<tr>
<td>Libyan Government of Higher Education and Scientific Research</td>
</tr>
<tr>
<td>Science and Technology Development Fund – Egypt</td>
</tr>
<tr>
<td>Sirt University Libya</td>
</tr>
<tr>
<td>University Kebangsaan Malaysia</td>
</tr>
</tbody>
</table>

Synopsis

There is good collaboration at the regional and international level with funding largely domestic.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Islamic Republic of Mauritania

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>5</td>
<td>Water research as a % of the total publications of Mauritania</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1.08 publications per million</td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

<table>
<thead>
<tr>
<th>Top publishing institutions for water research:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts et Metiers Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>University of Savoy Mont Blanc – Chambery</td>
<td></td>
</tr>
<tr>
<td>Université des Sciences, de Technologie et de Médecine</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research focus areas in water resources:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Chemical</td>
<td></td>
</tr>
<tr>
<td>Water Resources</td>
<td></td>
</tr>
</tbody>
</table>

Enablers*

| Top funding agencies: | None |

Synopsis

There are no funding agencies. Research focus areas are also limiting.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Kingdom of Morocco

Research output*

| Nr. of water research publications: | 428 | Water research as a % of the total publications of Morocco | 1,55% |
| Water research publications per million of the population: † | 1,16 publications per million |

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Cadi Ayyad University of Marrakech
- Institut de Rechercher pour le Developpment
- Centre National de la Recherche Scientifique
- Ibn Zohr University of Agadir
- Mohammed V University in Rabat

Research focus areas in water resources:
- Water Resources
- Environmental Sciences Ecology
- Geology
- Engineering
- Agriculture

Enablers*

Top funding agencies:
- French National Research Agency
- Portuguese Foundation for Science and Technology
- European Commission
- Centre National d’Etudes Spatiales
- International Atomic Energy Agency

Synopsis

There is a good collaboration between global and national organisations regarding water research. There is also a transdisciplinary focus regarding research areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Sahrawi Arab Democratic Republic

**Research output**

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>0</th>
<th>Water research as a % of the total publications of Sahrawi Arab Democratic Republic</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>0</td>
<td>publications per million</td>
<td></td>
</tr>
</tbody>
</table>

**Publishing institutions and water research focus areas**

**Top publishing institutions for water research:**

**Research focus areas in water resources:**

**Enablers**

**Top Funding Agencies:**

**Synopsis**

There are no results from Web of Science

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
## Country Profile: Republic of Tunisia

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>460</th>
<th>Water research as a % of the total publications of Tunisia</th>
<th>1,56%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>3.89 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

#### Top publishing institutions for water research:
- Universite de Carthage
- Université de Tunis El Manar (Université de Tunis - El Manar)
- Universite de Sfax
- National Engineering School of Sfax (École Nationale d’Ingénieurs de Sfax - ENIS)
- Faculty of Sciences of Tunis (FST) (Faculté des Sciences de Tunis (FST))

#### Research focus areas in water resources:
- Environmental Sciences
- Geoscience Multidisciplinary
- Engineering Civil
- Engineering Chemical
- Agronomy

### Enablers*

#### Top funding agencies:
- European Commission
- French National Research Agency
- United States Agency for International Development (USAID)
- Centre National d’Etudes Spatiales
- Centre National de la Recherche Scientifique

### Synopsis

There is a good transdisciplinary focus regarding research areas. There is also a good collaboration between national and global enabler organisations.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Benin

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>93</td>
<td>Water research as a % of the total publications of Benin</td>
<td>2.40%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>7.67 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
</tr>
<tr>
<td>University Abomey Calavi</td>
</tr>
<tr>
<td>University of Bonn</td>
</tr>
<tr>
<td>Africa Rice Center</td>
</tr>
<tr>
<td>Consultative Group on International Agricultural Research (CGIAR)</td>
</tr>
<tr>
<td>Institut de Recherche pour de le Development</td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
</tr>
<tr>
<td>Geology</td>
</tr>
<tr>
<td>Environmental Sciences Ecology</td>
</tr>
<tr>
<td>Agriculture</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Marine Freshwater Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
</tr>
<tr>
<td>Federal Ministry of Education Research*</td>
</tr>
<tr>
<td>International Foundation for Science*</td>
</tr>
<tr>
<td>Ministry of Agriculture Forestry, Forestries Japan*</td>
</tr>
<tr>
<td>European Commission*</td>
</tr>
<tr>
<td>Action Contre la Faim Collaborative Project*</td>
</tr>
<tr>
<td>Ambassade de Pays-Bas (Embassy of the Netherlands) (Programme OmiDelta)**</td>
</tr>
<tr>
<td>ProSEHA – GIZ**</td>
</tr>
<tr>
<td>Banque Mondiale (World Bank)**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synopsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be completed</td>
</tr>
</tbody>
</table>

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Burkina Faso

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>116</th>
<th>Water research as a % of the total publications of Burkina Faso</th>
<th>2.24%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>5.55 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:

- Institut de Recherche pour de le Development
- Centre National de la Recherche Scientifique
- Helmholtz Association
- University of Bonn
- 2iE: Institut International d'Ingénierie de l'Eau et de l'Environnement

Research focus areas in water resources:

- Environmental Sciences Ecology
- Geology
- Engineering
- Agriculture
- Business Economics

Enablers*

Top funding agencies:

- Federal Ministry of Education Research
- European Commission
- Bill and Melinda Gates Foundation
- International Fund for Agricultural Development
- Swiss Agency for Development and Cooperation

Synopsis

There is a good transdisciplinary focus regarding research areas. There is also the prominence of enablers from Europe and the USA.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
## Country Profile: Republic of Cabo Verde

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>9</th>
<th>Water research as a % of the total publications of Cabo Verde</th>
<th>2.90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1.62 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- Universidade de Lisboa
- Chinese Academy of Sciences
- University of Cabo Verde
- Wageningen University (Research)

**Research focus areas in water resources:**
- Environmental Sciences Ecology
- Agriculture
- Food Science Technology
- Biodiversity Conservation
- Engineering

### Enablers*

**Top funding agencies:**
- European Commission
- Portuguese Foundation for Science and Technology
- Aga Khan Development Network

### Synopsis

There is a good balance of transdisciplinary publications between ecology, agriculture, engineering and food science. There is also a good collaboration between national and global organisations regarding enablers.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Côte d’Ivoire

<table>
<thead>
<tr>
<th>Research output*</th>
<th>Water research as a % of the total publications of Côte d’Ivoire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>41</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1.55 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

<table>
<thead>
<tr>
<th>Top publishing institutions for water research:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Université de Carthage</td>
<td>• Université de Tunis El Manar (Université de Tunis - El Manar)</td>
</tr>
<tr>
<td>• Université de Sfax</td>
<td>• National Engineering School of Sfax (École Nationale d’Ingénieurs de Sfax - ENIS)</td>
</tr>
<tr>
<td>• Université de Sfax</td>
<td>• Faculty of Sciences of Tunis (FST) (Faculté des Sciences de Tunis (FST))</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research focus areas in water resources:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Environmental Sciences Ecology</td>
<td>• Geology</td>
</tr>
<tr>
<td>• Geology</td>
<td>• Engineering</td>
</tr>
<tr>
<td>• Engineering</td>
<td>• Microbiology</td>
</tr>
<tr>
<td>• Microbiology</td>
<td>• Public Environmental Occupational Health</td>
</tr>
</tbody>
</table>

Enablers*

<table>
<thead>
<tr>
<th>Top funding agencies:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bill and Melinda Gates Foundation</td>
<td>• Centre Suisse de Recherches Scientifiques en Côte d’Ivoire</td>
</tr>
<tr>
<td>• Centre Suisse de Recherches Scientifiques en Côte d’Ivoire</td>
<td>• European Union</td>
</tr>
<tr>
<td>• European Union</td>
<td>• Federal Ministry of Education Research</td>
</tr>
<tr>
<td>• Federal Ministry of Education Research</td>
<td>• Institut de Recherche pour le Developpment</td>
</tr>
<tr>
<td>• Institut de Recherche pour le Developpment</td>
<td>• CGIAR</td>
</tr>
</tbody>
</table>

Synopsis

The main funding enablers are from Europe that drives water research publication. There is little collaboration from national institutions. There is also a good combination regarding research focus areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from [www.worldometers.info](http://www.worldometers.info); ****Literature review
Country Profile: Republic of the Gambia

<table>
<thead>
<tr>
<th>Research output*</th>
<th>8</th>
<th>Water research as a % of the total publications of Gambia</th>
<th>0.15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>8</td>
<td>Water research publications per million of the population: †</td>
<td>3.31 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top publishing institutions for water research:</strong></td>
</tr>
<tr>
<td>• Department of Water Resources</td>
</tr>
<tr>
<td>• University Energy Natural Resources</td>
</tr>
<tr>
<td>• University of the Gambia</td>
</tr>
<tr>
<td>• West Africa Science Service Center on Climate Change and Adapted Land Use</td>
</tr>
<tr>
<td><strong>Research focus areas in water resources:</strong></td>
</tr>
<tr>
<td>• Water Resources</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top funding agencies:</strong></td>
</tr>
<tr>
<td>• Federal Ministry of Education Research</td>
</tr>
<tr>
<td>• German Government</td>
</tr>
<tr>
<td>• West Africa Science Service Center on Climate Change and Adapted Land Use</td>
</tr>
</tbody>
</table>

**Synopsis**

The research focus area is limited. Most enablers that support water research are European institutes, and there is little collaboration from national organisations.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Ghana

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>296</td>
<td></td>
</tr>
<tr>
<td>Water research as a % of the total publications of Ghana</td>
<td>2,07%</td>
<td></td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>9,53 publications per million</td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
• Kwame Nkrumah University of Science and Technology
• University of Ghana
• Consultative Group on International Agricultural Research (CGIAR)
• International Water Management Institute Africa (IWMI)
• University for Development Studies

Research focus areas in water resources:
• Environmental Sciences
• Engineering Civil
• Geoscience Multidisciplinary
• Agronomy
• Engineering Environmental

Enablers*

Top funding agencies:
• Federal Ministry of Education Research
• European Commission
• UK Research Innovation
• Natural Environment Research Council
• Netherlands Ministry of Development Cooperation Through the UNESCO Partnership Fund

Synopsis

There is good collaboration between global and national organisations that support water research and its publications. There is also a good combination of research focus areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Guinea-Bissau

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of Guinea-Bissau</td>
<td>0</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>0 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:

Research focus areas in water resources:

Enablers*

Top funding agencies:

Synopsis

There are no results under Web of Science.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Guinea

<table>
<thead>
<tr>
<th>Research output*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>6</td>
</tr>
<tr>
<td>Water research as a % of the total publications of Guinea</td>
<td>0.62%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>4.57 publications per million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publishing institutions and water research focus areas*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top publishing institutions for water research:</td>
<td></td>
</tr>
<tr>
<td>• Centre National de la Recherche Scientifique</td>
<td></td>
</tr>
<tr>
<td>• Communaute Universite Grenoble Alpes</td>
<td></td>
</tr>
<tr>
<td>• Institut de Recherche pour le Developpment</td>
<td></td>
</tr>
<tr>
<td>• Institut National Polytechnique de Grenoble</td>
<td></td>
</tr>
<tr>
<td>• Universite de Montpellier</td>
<td></td>
</tr>
<tr>
<td>Research focus areas in water resources:</td>
<td></td>
</tr>
<tr>
<td>• Environmental Sciences Ecology</td>
<td></td>
</tr>
<tr>
<td>• Meteorology Atmospheric Sciences</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top funding agencies:</td>
<td></td>
</tr>
<tr>
<td>• European Commission</td>
<td></td>
</tr>
</tbody>
</table>

Synopsis

The only funding agency is the European Union. Global collaboration is noted but it is very little at the national level. The research focus area is also limiting.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Liberia

### Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>5</th>
<th>Water research as a % of the total publications of Liberia</th>
<th>0,29%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>5,93 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- Beijing Forestry University
- Centre National de la Recherche Scientifique (Like the CSIR in RSA but with technology, not industrial in Brazil, under the Ministry of Science and Technology)
- Conservational International
- European Commission
- European Research Council

**Research focus areas in water resources:**
- Science Technology
- Emergency Medicine
- Public Environmental Occupational Health

### Enablers*

**Top funding agencies:**
- Centre for International Forestry
- Conselho Nacional de Desenvolvimento Cientifico E Technologico
- French National Research Agency
- United States Agency for International Development (USAID)
- Centre National d’Etudes Spatiales

### Synopsis

There are many global collaborations with European institutions, but little participation from national organisations. There is also a focus on health and medicine in the research focus area.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Mali

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research as a % of the total publications of Mali?</td>
<td>1,41%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>2,52 publications per million</td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Institut de Recherche pour le Developpement
- Centre National de la Recherche Scientifique
- Mohammed V University in Rabat
- University of Yaounde
- University of Montpellier

Research focus areas in water resources:
- Environmental Sciences Ecology
- Meteorology Atmospheric Sciences
- Agriculture
- Geology
- Engineering

Enablers*

Top funding agencies:
- Federal Ministry of Education Research
- Bam Gire
- Belgian Federal Science Policy Office
- Bill and Melinda Gates Foundation
- CGIAR

Synopsis

There is a good combination of both national and global organisations. There is also a good transdisciplinary focus with research areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Niger

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>47</th>
<th>Water research as a % of the total publications of Niger</th>
<th>4.13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1.94 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

**Top publishing institutions for water research:**
- Institut de Recherche pour le Developpement
- Universite de Montpellier
- Universite of Abdou Moumouni
- Centre National de la Recherche Scientifique
- Communautte Universite Grenoble

**Research focus areas in water resources:**
- Geology
- Environmental Sciences Ecology
- Agriculture
- Engineering
- Marine Freshwater Biology

Enablers*

**Top funding agencies:**
- Federal Ministry of Education Research
- French National Research Agency
- Agence Francise de Development
- Belgian Technical Cooperation
- Centre National d'Etudes Spatiales (CNES/TOSCA)

Synopsis

There is good collaboration with global organisations from Europe, but little participation from national institutes. There is also a good combination regarding the research focus areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Federal Republic of Nigeria

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>538</th>
<th>Water research as a % of the total publications of Nigeria</th>
<th>1,35%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>2,61 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- University of Nigeria
- Federal University of Technology
- University of Agriculture Abeokuta
- University of Ibadan
- University of Calabar

Research focus areas in water resources:
- Environmental Sciences
- Ecology
- Geology
- Engineering
- Agriculture
- Meteorology
- Atmospheric Sciences

Enablers*

Top funding agencies:
- Federal Ministry of Education Research
- National Natural Science Foundation of China
- Japan Society for the Promotion of Science
- Ministry of Education Culture Sports Science
- Alexander Von Humboldt Foundation
- AMCOW Secretariat in Abuja****

Synopsis

There is a very good combination between national and global partners from Europe, Asia and Africa. There is also a good transdisciplinary focus regarding the research areas,

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info **** literature review
Country Profile: Republic of Senegal

<table>
<thead>
<tr>
<th>Research output*</th>
<th>89</th>
<th>Water research as a % of the total publications of Senegal</th>
<th>1.45%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of water research publications:</td>
<td>89</td>
<td>Water research as a % of the total publications of Senegal</td>
<td>1.45%</td>
</tr>
<tr>
<td>Water research publications per million of the population: †</td>
<td>5.31 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

| Top publishing institutions for water Research: | University Cheikh Anta Diop Dakar Institut de Recherche pour le Developpement Universite de Montpellier Centre National de la Recherche Scientifique New Mexico State Universite |
| Research focus areas in water resources: | Environmental Sciences Ecology Geology Agriculture Engineering |

Enablers*

| Top funding agencies: | Swiss Development Corporation* University Gaston Berger* Agenzia Italiana per la Cooperazione allo Sviluppo* Bill and Melinda Gates Foundation* Consultative Group on International Agricultural Research (CGIAR)* UNESCO** Regional Partnership for Coastal and Marine Conservation (PRCM)** |

Synopsis

There is a prominence of enablers from Europe. There is also a transdisciplinary focus regarding research areas.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Republic of Sierra Leone

Research output*

<table>
<thead>
<tr>
<th>Nr. of water Research publications:</th>
<th>12</th>
<th>Water research as a % of the total publications of Sierra Leone</th>
<th>0,99%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>1,50 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- Hohai University
- Njala University
- Hydrology Bur Jiangxi Province
- University of Cambridge

Research focus areas in water resources:
- Engineering
- Environmental Sciences Ecology

Enablers*

Top funding agencies:
- National Natural Science of China
- Fundamental Research Funds for the Central Universities
- Jiangsu Polytech Institute
- Major Science and Technology Program for Water Pollution Control and Water Treatment in China
- Ports Authority (PAPD)

Synopsis

Enablers from Asia are prominent regarding water research publications. However, the research focus areas are limiting.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
Country Profile: Togolese Republic

Research output*

<table>
<thead>
<tr>
<th>Nr. of water research publications:</th>
<th>7</th>
<th>Water research as a % of the total publications of Togo</th>
<th>1,22%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water research publications per million of the population: †</td>
<td>8.46 publications per million</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Publishing institutions and water research focus areas*

Top publishing institutions for water research:
- University of Lome
- ADA Consulting Africa
- Friedrich Schiller University of Jena
- Lund University
- National Water Institute

Research focus areas in water resources:
- Water resources
- Environmental Sciences Ecology

Enablers*

Top funding agencies:
- African Union Commission
- Agricultural Science Center at Farmington
- Federal Ministry of Education and Research
- New Mexico State University
- West African Science Centre on Climate Change and Adapted Land Use

Synopsis

There is a good combination of both national, continental and global enablers. However, the research focus areas are limited, with publication affiliation domestic and international institutions.

Data sources: * WoS; ** Survey; † Calculated based on demographical data obtained from www.worldometers.info
## 15 RESULTS: REGIONAL PROFILES

### 15.1 Regional profile: Southern Africa

Based on AU countries but adopted for the project the SADC member states were considered for grouping of countries. Countries include:

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Angola</td>
<td>6</td>
<td>0.213</td>
<td>0.54%</td>
<td>USAid&lt;br&gt; Benguela Current Commission&lt;br&gt; UNESCO&lt;br&gt; International Development Research Centre (Canada)</td>
</tr>
<tr>
<td>Republic of Botswana</td>
<td>131</td>
<td>59,614</td>
<td>2.34%</td>
<td>University of Botswana&lt;br&gt; Government of Botswana&lt;br&gt; European Commission&lt;br&gt; Water Utilities Corporation of Botswana&lt;br&gt; Alexander Von Humboldt Foundation&lt;br&gt; National Science Foundation (United States)&lt;br&gt; USAid</td>
</tr>
<tr>
<td>Democratic Republic of Congo</td>
<td>52</td>
<td>0.648</td>
<td>1.10%</td>
<td>European Commission&lt;br&gt; Swiss National Science Foundation&lt;br&gt; Natural Science Foundation of China&lt;br&gt; Belgian Technical Cooperation&lt;br&gt; CAS Western Light&lt;br&gt; Flanders Research Foundation (FWO)&lt;br&gt; African Development Bank (AfDB)</td>
</tr>
<tr>
<td>Union of the Comoros</td>
<td>1</td>
<td>1,283</td>
<td>0.83%</td>
<td>UKAid&lt;br&gt; UKRI&lt;br&gt; French Development Agency&lt;br&gt; UPGro Grant (Natural Environment Research Council UK, now UKRI)</td>
</tr>
<tr>
<td>Kingdom of Lesotho</td>
<td>14</td>
<td>6,767</td>
<td>2.16%</td>
<td>ACF Mongolia&lt;br&gt; ACF France&lt;br&gt; Lesotho Highlands Development Authority</td>
</tr>
<tr>
<td>Country</td>
<td>Nr of Water Research publications*</td>
<td>Water Research publications per million population**</td>
<td>WR as % of total publications*</td>
<td>Enablers</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------</td>
<td>------------------------------------------------------</td>
<td>--------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Republic of Malawi</td>
<td>165</td>
<td>9,801</td>
<td>2.06%</td>
<td>• Consultative Group on International Agricultural Research (CGIAR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• ACF International</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Norwegian Programme for Development, Research and Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• UKRI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Government of Malawi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Natural Environment Research Council (now UK Research and Innovation (UKRI))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Malawian Universities (Polytechnic, Strathclyde)</td>
</tr>
<tr>
<td>Republic of Madagascar</td>
<td>29</td>
<td>1,188</td>
<td>0.80%</td>
<td>• French National Research Agency</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Qing Lan Project Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Bill and Melinda Gates Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Aird Cirad (French agricultural research and cooperation organization)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Blue Ventures</td>
</tr>
<tr>
<td>Republic of Mauritius</td>
<td>13</td>
<td>10,310</td>
<td>0.45%</td>
<td>• Mauritius Research Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Government of Mauritius (Ministries of Agriculture, Environment and Sustainable Development, Tertiary Education and Municipality of Port Louis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• European Commission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Mauritian Wildlife Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Finnish Funding Agency for Technology Innovation</td>
</tr>
<tr>
<td>Republic of Mozambique</td>
<td>95</td>
<td>3,468</td>
<td>2.07%</td>
<td>• European Commission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Australian Centre for International Agricultural Research</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Lars Erik Lundberg Scholarship Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Swedish International Development Agency (SIDA)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>• Consultative Group on International Agricultural Research (CGIAR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• National Research Fund of Mozambique</td>
</tr>
<tr>
<td>Republic of Namibia</td>
<td>94</td>
<td>44,363</td>
<td>2.81%</td>
<td>• National Research Foundation (NRF) (South Africa)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>• European Commission</td>
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<td>• National Science Foundation</td>
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<td>• German Federal Ministry of Education and Research</td>
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<td>Country</td>
<td>Nr of Water Research publications*</td>
<td>Water Research publications per million population**</td>
<td>WR as % of total publications*</td>
<td>Enablers</td>
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<tr>
<td>Republic of South Africa</td>
<td>3142</td>
<td>55,613</td>
<td>1,40%</td>
<td>Water Research Commission (WRC) (South Africa)</td>
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<td>Portuguese Foundation for Science and Technology</td>
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<td>National Research Foundation (South Africa) **</td>
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<td>WRC (South Africa) **</td>
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<td>CSIR (India)*</td>
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<td>Natural Science Foundation of China</td>
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<td>UK Research and Innovation (UKRI)</td>
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<td>European Commission **</td>
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<td>USAid</td>
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<td>Bill and Melinda Gates Foundation</td>
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<td></td>
<td></td>
<td>GWP Southern Africa****</td>
</tr>
<tr>
<td>Republic of Seychelles</td>
<td>6</td>
<td>63,790</td>
<td>0,90%</td>
<td>African Coelacanth Ecosystem Program</td>
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<td>Australian Research Council</td>
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<td>Global Finprint Project</td>
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<td></td>
<td>Government of Seychelles</td>
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<td></td>
<td></td>
<td></td>
<td>Isimangaliso Wetland Park</td>
</tr>
<tr>
<td>Kingdom of Eswatini</td>
<td>29</td>
<td>26,065</td>
<td>2,57%</td>
<td>Kolomela Mine</td>
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<td></td>
<td>Department of Science and Technology (India)</td>
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<td>Aware Foundation International</td>
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<td>Casa Barry Lodge</td>
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<td>Mintek (South Africa)</td>
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<td>Ministry of Education, Culture, Sports, Science and Technology (MEXT) (Japan)</td>
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<td>Israel Science Foundation</td>
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<td>Taiwan Government</td>
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<td>African Development Bank**</td>
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<td>World Bank**</td>
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<td></td>
<td>European Union**</td>
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<tr>
<td>United Republic of Tanzania</td>
<td>326</td>
<td>7,401</td>
<td>1,90%</td>
<td>UKRI</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>German Academic Exchange Service (DAAD)</td>
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<tr>
<td>Country</td>
<td>Nr of Water Research publications*</td>
<td>Water Research publications per million population**</td>
<td>WR as % of total publications*</td>
<td>Enablers</td>
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</tbody>
</table>
| Republic of Zambia       | 53                                | 3,895                                                 | 0,73%                         | - Natural Environment Research Council (the UK, now UKRI)  
- USAid  
- CGIAR                                                                 |
| Republic of Zimbabwe     | 288                               | 20,899                                                | 3,75%                         | - European Commission  
- ESRC (Economic Social Research Council in the UK, also now UKRI)  
- NERC (now UKRI)  
- UK Research and Innovation (UKRI)  
- Royal Society of London  
- WaterNet  
- African Centre of Excellence in the Internet of Things  
- Australian Centre for International Agriculture Research  
- International Foundation for Science  
- CGIAR  
- European Commission **  
- WaterNet Secretariat on Harare ****  
- UKAID**  
- Directorate-General for International Cooperation (DGIS)**  
- International Association of Hydrological Sciences (IAHS)** |

Data sources: ** Survey **** literature review

**Research output:**

It is evident that in the Southern African Region, South Africa produce, by far, the most water and sanitation research (~80%) (in line with findings of Elema, 2019). This highlights the role of the WRC and SA-NRF, however, most of the research is focused on South Africa – this is due to their mandates.

**Research focus areas:**

There are also clear thematic areas that are dominant in the research fields that dominate the water resources category on Web of Science across Southern Africa. These are:

- Geosciences Multidisciplinary
Meteorology Atmospheric Services
Environmental Sciences
Engineering (specifically Civil and Environmental)

There are also some variations amongst specific countries that also have other research fields in the top 5, such as Ecology, Marine Freshwater Biology, Oceanography, Soil Science and Agronomy.

**Predominant support for the SADC water sector**

The significant enablers of the region to be found in multiple countries as currently identified are as follows (in no particular order):

- Water Research Commission (WRC)
- NRF
- UKRI
- USAid
- WaterNet
- AUDA-NEPAD SANWATCE
- European Commission
- CGIAR

Another important aspect to note in this table is also important partners that have historical ties to their respective countries, such as the Democratic Republic of Congo with Belgium and Mozambique with Portugal. Beyond the more formalised funding institutions in science and technology, there are also numerous examples of financial institutions, such as the African Development Bank, and philanthropic or environmental organisations such as the Bill and Melinda Gates Foundation and Blue Ventures.

The significant enablers were confirmed by a key stakeholder (academic) working in the Southern Africa Water and Sanitation sector. This stakeholder also added the following significant enablers:

- Rural Water Supply Network (RWSN) - a global network for rural water supply professionals
- Cap-Net UNDP – international
- JICA (Japan International Cooperation Agency)
- UNICEF in Zambia – national
Another key stakeholder, an Africa-wide representative, added the following continental significant role-players:

- African Ministers’ Council on Water (AMCOW)
- Africa Water Association (AfWA)
- Africa River Basin Organisations (ANBO)
- Forum for Agricultural Research in Africa (FARA)
### 15.2 Regional profile: Central Africa

The Central African region refers to countries based on African Union countries but adopted for the project to consider Regional Environmental Centres (RECs) and River Basin Organisations such as in the case of the Nile River Basin.

<table>
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<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| Republic of Burundi      | 39                                | 3,280                                               | 2.58%                         | Turkish Scientific and Technical Research Council (TUBITAK)  
European Commission  
African Development Bank  
Japan Society for the Promotion of Science  
Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)  
Flemish Interuniversity Council (VLIR) |
| Republic of Cameroon     | 191                               | 7,195                                               | 1.07%                         | Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)  
European Commission  
German Research Foundation (DFG)  
Japan Society for the Promotion of Science  
French Institute of Research for Development (IRD)  
The PAU Institute for Governance, Humanities and Social Sciences, PAUGHSS is hosted at the University of Yaoundé II, and The Pan African Virtual and E- University (PAVEU)**** |
| Central African Republic | 7                                 | 1,449                                               | 0.33%                         | Department for International Development (DFID)  
French Embassy in the Central African Republic  
Canada's International Development Research  
Academy of Science of the Czech Republic  
PAPAVER-Centre for Human and Plant Studies in Europe and Northern Africa in the postglacial period  
Univerzita Karlova v Praze |
| Republic of Chad         | 247                               | 15,037                                              | 1.02%                         | United States Department of Agriculture (USDA)  
National Science Foundation (NSF) |
<table>
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<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congo Republic</td>
<td>59</td>
<td>10,692</td>
<td>0.92%</td>
<td>• The United States Environmental Protection Agency &lt;br&gt;• Natural Sciences and Engineering Research Council of Canada (NSERC) &lt;br&gt;• United States Geological Survey (USGS) &lt;br&gt;• Bureau of Reclamation</td>
</tr>
<tr>
<td>Republic of Equatorial Guinea</td>
<td>2</td>
<td>1,426</td>
<td>0.31%</td>
<td>• European Commission &lt;br&gt;• Swiss National Science Foundation (SNSF) &lt;br&gt;• Belgian Technical Cooperation (BTC) &lt;br&gt;• United States Agency for International Development (USAID) &lt;br&gt;• National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Gabonese Republic</td>
<td>10</td>
<td>4,493</td>
<td>0.32%</td>
<td>• African Monsoon Multidisciplinary Analysis (AMMA) &lt;br&gt;• French National Research Agency &lt;br&gt;• Mava Foundation &lt;br&gt;• AMEDE (Analyse Multi-Echelle de la Dynamique Eolienne au Sahel) &lt;br&gt;• OMARD tasks (Organic Marker Dynamics in tropical terrestrial environments)</td>
</tr>
<tr>
<td>Democratic Republic of São Tomé and Príncipe</td>
<td>3</td>
<td>13,689</td>
<td>1.05%</td>
<td>• California Academy of Sciences &lt;br&gt;• Coordenacao De Aperfeicoamento de Pessoal de Nivel Superior Capes &lt;br&gt;• Fundacao Calouste Gulbenkian Portugal &lt;br&gt;• Ministry of Public Works Infrastructures Natural Resources and Environment Mopirnao of The Democratic Republic of São Tomé and Príncipe &lt;br&gt;• Rufford Foundation &lt;br&gt;• World Bank Programme West Africa Coastal Area (WACA) Management</td>
</tr>
</tbody>
</table>
Research output:

In the Central African region, the Republic of Chad (44 %) and the Republic of Cameroon (34 %) are the highest contributors in the region to water and sanitation-related research output followed by the Congo Republic (11 %). Countries with a lower contribution to the region’s publication output include São Tomé and Príncipe, Equatorial Guinea and the Central African Republic. However, based on the country’s total publications, 2.6 % of Burundi’s research output is related to water and sanitation, where in Cameroon, São Tomé and Príncipe and Chad just over 1% of the publications are related to water and sanitation, and with lower contributions from the Central African Republic, Gabon and Equatorial Guinea with 0.3 % of their country publications.

The five most common water resources research focus areas identified within the region, based on Web of Science publications are:

**Water Research Focus Areas:**
- Water Resources
- Environmental Science Ecology
- Engineering
- Geology
- Marine Freshwater Biology

**Predominant support for the Central Africa water sector:**

Funding is predominantly foreign with funding agencies from Europe, Asia, mostly Japan, and the African Development Bank and a mix of other French, German, Netherlands, Canadian, and American-based institutions. The five predominant support institutions in the region are:

- European Commission
- Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)
- African Development Bank
- Swiss National Science Foundation (SNSF)
- Belgian Technical Cooperation (BTC)
### 15.3 Regional profile: Eastern Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| Republic of Djibouti                        | 12                                | 12,146                                              | 2.22%                          | • Centre d'Etude et de Recherche de Djibouti (CERD)  
  • King Saud University  
  • Mawari Project  
  • Ministère de l'Habitat, de l'Urbanisme                                                                                                           |
| Arab Republic of Egypt                      | 2352                              | 22,983                                              | 1.18%                          | • Science and Technology Development Fund - Egypt  
  • Deanship of Scientific Research (King Saud University)  
  • National Science Foundation (NSF)  
  • Deanship of Scientific Research (King Abdulaziz University)  
  • Ministry of Higher Education Scientific Research (MHESR)  
  • European Commission                                                                                                                                  |
| Federal Democratic Republic of Ethiopia     | 1020                              | 8,872                                               | 2.89%                          | • United States Agency for International Development (USAID)  
  • European Commission  
  • Addis Ababa University  
  • International Foundation for Science  
  • National Science Foundation (NSF)                                                                                                                   |
| State of Eritrea                            | 21                                | 5,921                                               | 1.69%                          | • Thailand International Cooperation Agency (TICA)  
  • University of Bern  
  • China Scholarship Council  
  • Water Research Commission (WRC) South African  
  • Netherlands Organisation for International Cooperation in Higher Education                                                                             |
| Republic of Kenya                           | 679                               | 12,628                                              | 1.49%                          | • Flemish Interuniversity Council (VLIR)  
  • Swedish International Development Agency (SIDA)  
  • Consultative Group on International Agricultural Research (CGIAR)  
  • South Africa Water Research Commission (WRC)  
  • Western Indian Ocean Marine Science Association (WIOMSA)                                                                                             |
| Republic of Rwanda                          | 88                                | 6,794                                               | 1.18%                          | • Chinese Academy of Sciences  
  • National Basic Research Program of China  
  • Netherlands Government                                                                                                                             |
<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Republic of Somalia</td>
<td>21</td>
<td>1,321</td>
<td>0.92%</td>
<td>- European Commission</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>- National Natural Science Foundation of China (NSFC)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>- European Commission</td>
</tr>
<tr>
<td>Republic of South Sudan</td>
<td>50</td>
<td>4,467</td>
<td>1.54%</td>
<td>- United States Agency for International Development (USAID) **</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- United States Geological Survey (USGS)</td>
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<td></td>
<td>- Curtin University</td>
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<td>- Ministry of Education, Culture, Sports, Science and Technology, Japan</td>
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<td></td>
<td></td>
<td>- Japan International Cooperation Agency (JICA) **</td>
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<td>- Dutch Government**</td>
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<td></td>
<td>- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**</td>
</tr>
<tr>
<td>Republic of the Sudan</td>
<td>269</td>
<td>6,135</td>
<td>1.71%</td>
<td>- African Development Bank (AfDB)**</td>
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<td>- World Bank**</td>
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<td>- Department for International Development (DFID)**</td>
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<td>- Skills Development Corporation (SDC)**</td>
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<td></td>
<td>- Agence Française de Développement (AFD)**</td>
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<tr>
<td>Republic of Uganda</td>
<td>344</td>
<td>7,521</td>
<td>1.31%</td>
<td>- Centre for Water Resource Research (CWRR)**</td>
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<td></td>
<td>- KfW Development Bank**</td>
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<td></td>
<td></td>
<td>- United Nations Educational, Scientific and Cultural Organization</td>
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<td>- (UNESCO)</td>
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<td></td>
<td>- Netherlands Organisation for International Cooperation in Higher</td>
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<td>- Education (NUFFIC)</td>
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<td>- National Natural Science Foundation of China (NSFC)</td>
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<td>- German Academic Exchange Service (DAAD)</td>
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<td>- Netherlands Organization for Scientific Research (NWO)</td>
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</tbody>
</table>

** Note: * indicates number of publications, ** indicates enablers.
Research Output

Research output (publications) in the Eastern African region related to water and sanitation is dominated by Egypt (48 %), followed by Ethiopia (21 %) and Kenya (14 %). Other countries in the region have a low contribution to research output, especially countries such as South Sudan, Djibouti and Eritrea. However, when looking at the percentage contribution based on the country’s overall research output, Ethiopia’s water and sanitation research output contributes about 3% of the research output, followed by Djibouti (2.2 %), Sudan (1.7 %), Eritrea (1.7%).

Water Research Focus Areas:

- Environmental Science Ecology
- Engineering
- Geology
- Agriculture
- Meteorology Atmospheric Sciences,

Additionally, some of the more common research areas are in Marine Freshwater Biology, Public Environmental Occupational Health and Science and Technology Other Topics.

Predominant support for the Eastern Africa water sector:

Funding is also predominantly foreign.

- European Commission (through the European Union)
- Egyptian Science and Technology Development Fund
- United States Agency for International Development (USAID)
• Bill and Melinda Gates Foundation
• Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
• Natural Environmental Research Council (NERC) – now UK Research and Innovation (UKRI)
• United Nations Educational, Scientific and Cultural Organization (UNESCO)
• Consultative Group on International Agricultural Research (CGIAR)

And a mix of other French, Finnish, Swedish Netherlands, Japanese and Chinese based institutions.
### 15.4 Regional profile: Northern Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| People's Democratic Republic of Algeria      | 405                                | 9,240                                               | 1.84%                          | • French National Research Agency  
• African Union Commission  
• National Natural Science Foundation of China  
• Alexander Von Humboldt Foundation  
• Australian Research Council                  |
| State of Libya                               | 40                                 | 5,820                                               | 1.30%                          | • Libyan Ministry of Higher Education  
• Libyan Government of Higher Education and Scientific Research  
• Science and Technology Development Fund – Egypt  
• Sirt University Libya  
• University Kebangsaan Malaysia                |
| Islamic Republic of Mauritania               | 5                                  | 1,080                                               | 2.33%                          |                                                                                                                                                                                                          |
| Kingdom of Morocco                           | 428                                | 1,160                                               | 1.55%                          | • French National Research Agency  
• Portuguese Foundation for Science and Technology  
• European Commission  
• Centre National d’Etudes Spatiales  
• International Atomic Energy Agency (IAEA)    |
| Sahrawi Arab Democratic Republic             | 0                                  | 0,000                                               | 0%                             | • European Commission  
• French National Research Agency  
• United States Agency for International Development (USAID)  
• Centre National d’Etudes Spatiales  
• Centre National de la Recherche Scientifique |
| Republic of Tunisia                          | 460                                | 3,890                                               | 1.56%                          | • European Commission  
• French National Research Agency  
• United States Agency for International Development (USAID)  
• Centre National d’Etudes Spatiales  
• Centre National de la Recherche Scientifique |
Research Output:
There is a good number of water-related publications in Northern Africa, as well as good collaborations with European, African and Asian institutions that contribute to the mix of domestic, continental and global funding enablers. Tunisia and Morocco have the most outputs; while two countries, namely, Sahrawi Arab Democratic Republic and the Islamic Republic of Mauritania, have no research publications on water and sanitation-related fields, from the Web of Science. The water-related publications in Egypt show that there are good collaborations both domestically and internationally. Alternatively, Tunisia and Morocco focus more on international collaboration and less on domestic outputs.

Thematic fields:
- Environmental Sciences Ecology
- Engineering
- Geology
- Water Resources
- Agriculture

There are also some variations amongst specific countries that also have other research fields in the top 5, such as Ecology, Marine Freshwater Biology, Oceanography, Soil Science and Agronomy.

Predominant support for the Northern Africa water sector:
Funding is also predominantly regional and foreign. The key enablers in this region are:
- European Commission
- French National Research Agency
- National d’Etudes Spatiales

Other enablers consider universities, governments, bank organisations as well as funding and research institutions, based in Germany, Australia, France, and Malaysia.
## 15.5 Regional Profile: Western Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Benin</td>
<td>93</td>
<td>7,670</td>
<td>2.40%</td>
<td>• Federal Ministry of Education Research</td>
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<td>• International Foundation for Science</td>
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<td>• Ministry of Agriculture Forestry, Forestries Japan</td>
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<td>• European Commission</td>
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<td>• Action Contre la Faim Collaborative Project</td>
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<td>• Ambassade de Pays-Bas (Embassy of the Netherlands) (Programme OmiDelta)**</td>
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<td>• ProSEHA – GIZ**</td>
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<td></td>
<td></td>
<td>• Banque Mondiale (World Bank) **</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>116</td>
<td>5,550</td>
<td>2.24%</td>
<td>• Federal Ministry of Education Research</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• European Commission</td>
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<td></td>
<td></td>
<td>• Bill and Melinda Gates Foundation</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• International Fund for Agricultural Development</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Swiss Agency for Development and Cooperation</td>
</tr>
<tr>
<td>Republic of Cabo Verde</td>
<td>9</td>
<td>1,620</td>
<td>2.9%</td>
<td>• European Commission</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>• Portuguese Foundation for Science and Technology</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>• Aga Khan Development Network</td>
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<tr>
<td>Republic of Côte d'Ivoire</td>
<td>41</td>
<td>1,550</td>
<td>1.19%</td>
<td>• Bill and Melinda Gates Foundation</td>
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<tr>
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<td></td>
<td>• Centre Suisse de Recherches Scientifiques en Côte d’Ivoire</td>
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<td></td>
<td>• European Union</td>
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<td>• Federal Ministry of Education Research</td>
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<td>• Institut de Recherche pour le Development</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Consultative Group on International Agricultural Research (CGIAR)</td>
</tr>
<tr>
<td>Republic of the Gambia</td>
<td>8</td>
<td>3,310</td>
<td>0.15%</td>
<td>• Federal Ministry of Education Research</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• German Government</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• West Africa Science Service Center on Climate Change and Adapted Land Use</td>
</tr>
<tr>
<td>Country</td>
<td>Nr of Water Research publications*</td>
<td>Water Research publications per million population**</td>
<td>WR as % of total publications*</td>
<td>Enablers</td>
</tr>
<tr>
<td>-------------------------</td>
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</tr>
<tr>
<td>Republic of Ghana</td>
<td>296</td>
<td>9,530</td>
<td>2.07%</td>
<td>• International Water Management Institute Africa (IWMI)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Federal Ministry of Education Research</td>
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<td></td>
<td>• European Commission</td>
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<td></td>
<td>• UK Research Innovation (UKRI)</td>
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<td></td>
<td></td>
<td>• Natural Environment Research Council (NERC)</td>
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<td></td>
<td>• Netherlands Ministry of Development Cooperation Through the UNESCO</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>Partnership Fund</td>
</tr>
<tr>
<td>Republic of Guinea-Bissau</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>• European Commission</td>
</tr>
<tr>
<td>Republic of Guinea</td>
<td>6</td>
<td>4,570</td>
<td>0.62%</td>
<td></td>
</tr>
<tr>
<td>Republic of Liberia</td>
<td>3</td>
<td>5,930</td>
<td>0.29%</td>
<td>• Centre for International Forestry</td>
</tr>
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<td></td>
<td></td>
<td>• Conselho Nacional de Desenvolvimento Cientifico E Technologico</td>
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<td></td>
<td></td>
<td></td>
<td>• French National Research Agency</td>
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<td></td>
<td></td>
<td>• United States Agency for International Development (USAID)</td>
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<td></td>
<td></td>
<td></td>
<td>• Centre National d’Etudes Spatiales</td>
</tr>
<tr>
<td>Republic of Mali</td>
<td>51</td>
<td>2,520</td>
<td>1.41%</td>
<td>• Federal Ministry of Education Research</td>
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<td></td>
<td>• Bam Gire</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Belgian Federal Science Policy Office</td>
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<td></td>
<td></td>
<td>• Bill and Melinda Gates Foundation</td>
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<td></td>
<td></td>
<td></td>
<td>• CGIAR</td>
</tr>
<tr>
<td>Republic of Niger</td>
<td>47</td>
<td>1,940</td>
<td>4.13%</td>
<td>• Federal Ministry of Education Research</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• French National Research Agency</td>
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<td></td>
<td>• Agence Francise de Development</td>
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<td>• Belgian Technical Cooperation</td>
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<td></td>
<td></td>
<td>• Centre National d’Etudes Spatiales (CNES/TOSCA)</td>
</tr>
<tr>
<td>Federal Republic of</td>
<td>538</td>
<td>2,610</td>
<td>1.35%</td>
<td>• Federal Ministry of Education Research</td>
</tr>
<tr>
<td>Nigeria</td>
<td></td>
<td></td>
<td></td>
<td>• National Natural Science Foundation of China</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Japan Society for the Promotion of Science</td>
</tr>
</tbody>
</table>
### Research Output:

There is a high number of water-related publications in Western Africa, with collaborations from both continentally and internationally. Nigeria has the most water-related research publications, followed by Ghana and Burkino Faso. Liberia and Guinea have the least amount of water-related research publications. However, there was only one country called Guinea-Bissau where there were no water-research publications found under Web of Science. Nigeria has extensive

<table>
<thead>
<tr>
<th>Country</th>
<th>Nr of Water Research publications*</th>
<th>Water Research publications per million population**</th>
<th>WR as % of total publications*</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Senegal</td>
<td>89</td>
<td>5,310</td>
<td>1.45%</td>
<td>• Ministry of Education Culture Sports Science</td>
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<tr>
<td></td>
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<td></td>
<td>• Alexander Von Humboldt Foundation</td>
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<td></td>
<td>• AMCOW Secretariat in Abuja****</td>
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<td>• Swiss Development Corporation</td>
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<td></td>
<td>• University Gaston Berger</td>
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<td></td>
<td></td>
<td></td>
<td>• Agenzia Italiana per la Cooperazione allo Sviluppo</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Bill and Melinda Gates Foundation</td>
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<td></td>
<td></td>
<td>• CGIAR</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• UNESCO**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Regional Partnership for Coastal and Marine Conservation (PRCM)**</td>
</tr>
<tr>
<td>Republic of Sierra Leone</td>
<td>12</td>
<td>1,500</td>
<td>0.99%</td>
<td>• National Natural Science of China</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Fundamental Research Funds for the Central Universities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Jiangsu Polytech Institute</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Major Science and Technology Program for Water Pollution Control and Water Treatment in China</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ports Authority (PAPD)</td>
</tr>
<tr>
<td>Togolese Republic</td>
<td>7</td>
<td>8,460</td>
<td>1.22%</td>
<td>• African Union Commission (AUC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Agricultural Science Center at Farmington</td>
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<td></td>
<td></td>
<td></td>
<td>• Federal Ministry of Education and Research</td>
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<td></td>
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<td></td>
<td>• New Mexico State University</td>
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<td></td>
<td></td>
<td></td>
<td>• West African Science Centre on Climate Change and Adapted Land Use</td>
</tr>
</tbody>
</table>

Data sources: ** Survey **** literature review
collaborative enabler networks that extend to Japan, Germany and China. There is also a dependency on French enabler institutions to support water and sanitation-related research in West African countries such as Sierra Leone, Senegal and Togo.

**Thematic fields:**
- Environmental Sciences Ecology
- Geology
- Engineering
- Agriculture

There are also some variations amongst specific countries that also have other research fields in the top 4, such as Marine Freshwater Biology, Meteorology Atmospheric Sciences, Water Resources and Public Environmental Occupational Health.

**Predominant support for the Western Africa water sector:**
Funding is also predominantly foreign.
- USAID – highlighted by key stakeholder
- World Bank – highlighted by key stakeholder
- SIDA – highlighted by key stakeholder
- European Commission
- Bill and Melinda Gates Foundation
- Consultative Group on International Agricultural Research (CGIAR)

The significant enablers were confirmed by a **key stakeholder** working in the West Africa Water and Sanitation sector. The following significant enablers were also added:
- Rural Water Supply Network (RWSN) - a global network for rural water supply professionals
- African Development Bank – financial
- Islamic Development Bank – financial
- French Development Agency – financial
- National Youth Parliaments for Water and Sanitation in West African countries;
- Centre de Coordination des Ressources en Eau (CCRE)/ Water Resources Coordination Center – West Africa
- Les organes de gestion des bassins transfrontaliers (ABN, ABV, AN, etc)/ Transboundary basin management bodies
• Access development – West Africa
• Water4 – West Africa
• Red Cross
• WaterAid
• IRC (International Rescue Committee)
• OXFAM
• Eau vive
• SOS Sahel
• ACF (Action Against Hunger) – West Africa
• PPI (Small-Scale Initiatives Program) – Central and West Africa
• Plan International
• Winrock international
• Caritas international
• UNICEF
• Ingénieurs sans frontiers (ISF);
• Pan-African Intergovernmental Agency for Water and Sanitation (EAA WSA CREPA)
• International Institute for Water and Environmental Engineering (2iE)
• Wallonie-Bruxelles International
• Bureau de recherches géologiques et minières (BRGM)
• Denmark's development cooperation (DANIDA)
• Instructions de l'Agence suédoise de coopération internationale au développement (Asdi)
• Agence Luxembourgeoise pour la Coopération au Développement - LUX DEV
• Foundation Hilton
• Fondation Conrad Hilton
• Fonds Koweitien
• Fonds qatari pour le développement (QFFD)
• Agence belge de développement – Enabel
• Université Pierre et Marie Curie–Paris 6 (UPMC)
• Université de Montpellier
Another key stakeholder, a continental representative, added the following significant role-players:

- African Ministers’ Council on Water (AMCOW) – continental
- Africa Water Association (AfWA) – continental
- CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development) – regional
- Africa River Basin Organisations (ANBO) – continental
- Forum for Agricultural Research in Africa (FARA) – continental
- OMVS - Senegal River Basin Development Organization – regional
- International Water Management Institute Africa (IWMI) – international
- Arab Bank for Economic Development in Africa (BADEA) – regional
16 RESULTS: PRELIMINARY SIGNIFICANT ROLE-PLAYERS

Based on the results of the bibliometric analysis and preliminary feedback from the online survey, significant role-players in the African Water Sector were identified for further data collection and analysis. Data from this section will be refined as the project progress and supplemented in certain cases with interviews.
16.1 Most Significant Research and Innovation Units

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Head Office/Secretariat:</td>
<td>Pretoria, South Africa</td>
<td>Geographical scope:</td>
<td>Predominantly South Africa but also projects in Southern Africa.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mandate:**

Established in 1971 through an Act of parliament, it was deemed to be of national importance to generate new knowledge and to promote the country’s water research purposefully, owing to the view held that water would be one of South Africa’s most limiting factors in the 21st century.

Currently, South Africa is still under threat of a lack of sufficient water, while water quality and availability issues are becoming more acute. However, the country is much better prepared to deal with this problem owing to the WRC’s meaningful contribution to the development of the capacity of the water sector, the broadening of the country’s water-centred R&D base, and the WRC’s continued commitment to direct and fund research on critical issues.

WRC’s primary function is to:

- Promote coordination, cooperation and communication in the area of water research
- Establish water research needs and priorities
- Stimulate and fund water research according to priority
- Promote the effective transfer of information and technology
- Enhance knowledge and capacity building within the water sector

With this mandate, the WRC’s vision is “to have highly informed water decision-making through science and technology at all levels, in all stakeholder groups, and innovative water solutions through research and development for South Africa, Africa and the world.”


**Strategic Objectives:**

WRC’s mission is to be a global water knowledge node and South Africa’s premier water knowledge hub active across the innovation value chain and is oriented by the following strategic outcome-oriented goals:

- Informs policy and decision-making
- Creates new products, innovation and services for socio-economic development,
- Develops human capital in the water science sector,
- Empowers communities and reduces poverty
- Supports the national transformation and redress project, and
- Develops sustainable solutions and deepens water research and development in South Africa, Africa and the developing world.


**Alignment with National, Regional and Continental:**

International:

1. Global Water Coalition research agenda as a member: The member organisations are all in charge of a national research program addressing the urban water cycle. They have provided the impetus, credibility, and initial funding for the GWRC. Each member and associated partner bring a unique set of skills and knowledge to the Coalition
### Policy Agendas:

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.globalwaterresearchcoalition.net/about-us/">http://www.globalwaterresearchcoalition.net/about-us/</a></td>
<td>2. Framework for United Nations 2030 Agenda-Sustainable Development Goals (SDGs) for South Africa-WRC’s adoption of SDG 6-Ensuring availability and sustainable management of water and sanitation for all. This framework provides an overview and baseline for hygiene targets and indicators for hygiene and sanitation for SDGs 1, 3, 4, 11 and 13.</td>
</tr>
</tbody>
</table>
10. The National Water and Sanitation Masterplan by the Department of Water and Sanitation commits to support water-related research, development and innovation.

11. National Water Resource Strategy 2 (NWRS-2)-WRC’s strategy is designed to support the refinement and implementation of the NWRS-2 together with DWS and associated departmental plans for water services and sanitation.

12. President-led National Infrastructure Plan, Strategic Integrated Projects (SIPs), Department of Environmental Affairs, Forestry and Fisheries-led Climate Change Response Strategy and Department of Science and Innovation’s (DSI) 10-year Innovation Plan and South African sustainable Development Agenda are other components of water resource contribution the WRC is actively involved in.

Legislation, mandates and agendas

- Constitutional:
  a. Bill of Rights section 27.1b (right to have sufficient access to water).
  b. Section 16 (...freedom of expression; the right to academic freedom and freedom of scientific research).

- Legislative mandates and reviews:
  a. Water Research Act (WRA) Act No. 34 of 1971-outlines the purpose and mandated objectives of the WRC and sets the framework within which the WRC operates.
  b. Public Finance Management Act (PFMA) Act No. 1 of 1999-directs how WRC operates and accounts for its activities.
  c. Department of Water and Sanitation policies (Water Services Act (Act No. 108 of 1997) provides for the right of access to basic water supply and sanitation by setting national standards and norms. The WRC has to respond to water supply and sanitation needs with research and development that helps to address those needs.
  d. National Water Act (NWA) (Act No 36 of 1998) mandates objectives of the WRC which provides for the pricing strategy for water use charges, the primary mechanism for the calculation of a charge, payable by some or all raw water users, that is also set for research purposes by the WRC. Therefore, the WRC’s role is to align its funding priorities with those key national water challenges articulated in the NWA and help solve water-related problems which are critical to South Africa’s sustainable development and economic growth.

All three Acts are being revised, and have a strong possibility of being amended to strengthen the WRC mandate (please see updated Acts once published)

Source: WRC Annual Report 2019/20
<table>
<thead>
<tr>
<th><strong>Name:</strong> European Commission</th>
<th><strong>Website:</strong> <a href="https://ec.europa.eu/info/index_en">https://ec.europa.eu/info/index_en</a></th>
<th><strong>Category:</strong> Government</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head Office/Secretariat:</strong> Brussels, Belgium</td>
<td><strong>Geographical scope:</strong> Regional and international</td>
<td></td>
</tr>
</tbody>
</table>

**Mandate:**

The European Commission is the executive branch of the European Union (EU), responsible for proposing legislation, enforcing European Union laws and directing the union’s administrative operations.

In terms of water resources, through the MEP Water Group, the EU launched the Green Deal, which aims to address and contribute to efforts to tackle challenges that come with the increasing threat of climate change as water risk management is one of the greatest challenges humanity is facing today.

Source: [https://mepwatergroup.eu/about-us/](https://mepwatergroup.eu/about-us/)

**Strategic Objectives:**

The political strategy of this Commission is to set Europe on a path to successfully achieving climate neutrality by 2050, shaping our digital future, strengthening our unique social market economy, building a Union of prosperity, and making Europe stronger in the world.

The MEP Water Group wants to play a key role in contributing to the future of the EU water policy by:

- Raising the importance of water for the EU and beyond
- Make sure that Europe’s water resources are managed sustainably and equitably to the benefit of the European economy and society.
- Encourage technological and non-technological innovations and research to tackle water-related challenges.
- Promoting access to water for all.

Source: [https://mepwatergroup.eu/about-us/](https://mepwatergroup.eu/about-us/)

**Alignment with National, Regional and Continental Policy Agendas:**

The European Commission works in alignment with:

**International:**

1. UN 2030 Agenda on Sustainable Development Goals (SDGs)-the commission’s President’s political programme integrates the SDGs into all commission proposals, policies and strategies and all 17 SDGs feature in one or more of the six ambitions announced in the President’s political Guidelines:
   - European Green Deal (SDGs 2,3,6,7-15)
   - The economy that works for the people (SDGs 1,3-5 and 8-10)
   - Europe fit for the digital age (SDGs 4 and 9)
   - The European way of life (SDGs 3,4,10 and 16)
   - Stronger Europe in the world (SDG 17)
   - European Democracy (SDGs 5,10 and 16)

2. African Union (AU) partnership with European Union (EU) strategic partnership-to strengthen strategic alliance built on five partnerships:
   a. Partnership for green transition and energy access (includes water resources and sanitation)
   b. Partnership for digital transformation
   c. Partnership for sustainable growth and hobs
   d. Partnership for peace and governance
   e. Partnership on migration and mobility.

*Engagements are still in progress and will continue at a bilateral, regional and continental level.


3. Group of Eight (G8)-the EC promotes cooperation with advanced countries with the G8 presidencies to ensure a strong focus is maintained on development issues, in particular in Africa.

4. G20 Development Cooperation Member-A forum for international economic and financial cooperation in which the EU is a member where the EC actively contributes to the implementation of the G20 development agenda

Source: https://ec.europa.eu/info/aid-development-cooperation-fundamental-rights/who-we-work/multilateral-dialogue-informal-groupings-g8-g20_en

Continental:

5. European Union-The European Commission plays an active role in developing the EU’s overall strategy and in designing and implementing EU policies.

6. Water Europe (WE) was initiated by European Commission as the European Technology Platform for water and represents the whole value-chain of the water to achieve a European Water-Smart Society. WE’s actions are guided by the Water Vision 2030

UNESCO

Website: https://en.unesco.org

Category: Intergovernmental

Head Office/Secretariat: Paris, France

Geographical scope: Global and Regional developing countries and island states

Mandate:
The United Nations Educational, Scientific and Cultural Organization is a specialised agency of the United Nations aimed at promoting world peace and security through international cooperation in education, the sciences, and culture.

UNESCO has a unique role to play in strengthening the foundations of lasting peace and equitable and sustainable development. Advancing cooperation in education, the sciences, culture, communication and information holds strategic stakes at a time when societies across the world face the rising pressures of change and the international community faces new challenges. Through the World Water Assessment Programme (WWAP), Intergovernmental Hydrological Programme (IHP), Regional Water Centres and UNESCO Water-related Chairs are some of the main initiatives aiding in reaching UNESCO’s mandates and strategic objectives in relation to water resources.

Source: https://en.unesco.org/themes/water-security/hydrology

Strategic Objectives:
UNESCO established the World Water Assessment Programme (WWAP) in 2000 in response to a call from the UN Commission on Sustainable Development (CSD) to produce a UN system-wide periodic global overview of the status in terms of quantity and quality, use and management of freshwater resources. The objective is "to meet the growing requirements of the UN Member States and the international community for a wider range of policy-relevant, timely and reliable information in various fields of water resources developments and management, in particular through the production of the United Nations World Water Development Report (WWDR). Therefore, the WWAP aims to equip water managers and policy- and decision-makers with the knowledge, tools and skills necessary to formulate and implement sustainable water policies.

The mandate of WWAP in fostering global processes to achieve water security and sustainability is defined by several Strategic Objectives:

- Helping Member States to assess their water resources and the efficiency and effectiveness of their water policy decisions and programmes,
- Assisting Member States to build and improve their capacities to collect and analyse data of relevance to their water policy initiatives;
- Developing conceptual and methodological frameworks for internationally comparable data and indicators for water resources;
- Analysing data in partnership with policy-makers and researchers, and promoting wider and more informed use of data for policy purposes at different scales;
- Disseminating WWAP messages and results by producing various means of effective communication tools and public education material; and
- Developing regional, sub-regional and national case studies and best practices, as well as regional water development reports, underpinned with regional data sets.

Source: https://en.unesco.org/wwap/about-us
The Intergovernmental Hydrological Programme (IHP) is the only intergovernmental programme of the United Nations system devoted to water research and management, and related education and capacity development. The IHP facilitates an interdisciplinary and integrated approach to watershed and aquifer management, incorporating the social dimension of water, and supports international cooperation in hydrological and freshwater sciences and at the interface with policy-makers, and reinforces institutional and individual capacities. The main objective of IHP’s current, eighth phase (IHP-VIII 2014-2021) is to put science into action required for water security.

The Intergovernmental Hydrological Programme stimulates and encourages hydrological research and assists the Member States in research and training activities. Its eight-phase focuses on six thematic areas:

- water-related disasters and hydrological changes;
- groundwater in a changing environment;
- addressing water scarcity and quality;
- water and human settlements of the future;
- ecohydrology, engineering harmony for a sustainable world; and
- water education, the key to water security.

By bringing innovative, multidisciplinary and environmentally sound methods and tools into play, while fostering and capitalizing on advances in water sciences, IHP acts at the science-policy interface.

UNESCO has and continues to grow a network of water-related centres focusing on relevant thematic and geographic priorities in their areas of expertise to address water security:

1. The Regional Centre for Training and Water Studies (RCTWS) of Arid and Semi-Arid Zones was established in 2002 and is based in Egypt. The RCTWS provides information on the science and technology of arid and semi-arid zones and promotes policies leading to integrated and sustainable water resources management.

2. Regional Centre for Shared Aquifer Resources Management (RCSARM) was established in 2008 and is currently based in Libya. The Centre aims to generate and provide scientific and technical information and support the exchange of information on regional shared groundwater management issues, with emphasis on Africa and the Arab States.

3. Regional Centre on Groundwater Resources Education, Training and Research in East Africa (RCGRE) was established in 2011 and is based in the Nairobi Water Institute, Kenya. This centre aims to provide training and encourage research; generate and provide scientific and technical information and support the exchange of information, in particular concerning local scientific, technical and managerial knowledge, in the various domains of groundwater knowledge and management.

4. Regional Centre for Integrated River Basin Management (RC-IRBM), established in 2013 and based in National Water Resources Institute, Nigeria. It aims to act as a facilitator and synergistic structure to articulate the different scientific and institutional stakeholders at local, national, regional, and international levels regarding the implementation of IRBM, particularly in the West African Region. The centre focusses on research in the area of hydro-informatics, IWRM, and socio-economic research and to provide IRBM training, tertiary education for water professionals.
5. Regional Centre on Capacity Development and Research in Water Harvesting (RCWH) established in 2014 at the Khartoum National Training of the Public Water Cooperation, Sudan. The aim of this centre is to provide training and research opportunities; generate and provide scientific and technical information and support the exchange of information, in particular with regard to local scientific, technical and managerial knowledge, in the various domains of water harvesting.

Source: https://en.unesco.org/themes/water-security/centres

Additionally, the Water Information Network System (WINS) was launched in 2017, an open access and free participatory platform for sharing, accessing and visualizing water-related information, as well as for connecting water stakeholders. Developed and maintained by the Intergovernmental Hydrological Programme (IHP) of UNESCO, WINS is a tool aimed at supporting decision-making, deriving policy recommendations, and building capacity for sound, efficient, and scientific-based water resources management. As a user-friendly and interactive tool, WINS allows access to various types of information (maps, reports, graph, etc.) covering the entire water cycle, ranging from groundwater to urban water through gender issues, from local to global scale.

Source: https://en.unesco.org/ihp-wins

Water-related UNESCO chairs in Africa:

- Water Resources, Planning and Environmental Engineering Established in 2016 at the Ethiopian Institute of Technology, Mekelle University, Ethiopia
- Geohydrology, established in 1999 at the University of the Western Cape, South Africa
- Water Resources, established in 1994 at Omdurman Islamic University, Khartoum, Sudan
- UNESCO Interdisciplinary Chair in Sustainable Water Resources Management, established in 1998 at the Hassania School of Public Works, Morocco
- Water Management, established in 2008 at the University of Bangui, Central African Republic
- Ecohydrology and Transboundary Water Management, established in 2019 at Sokoine University of Agriculture, Tanzania
- Water, Women and Decision-making, established in 2006 at the Ivorian Center of Economy and Social Research (CIRES), Abidjan, Côte d'Ivoire and at the University Al Akhawayn, Ifrane, Morocco
- Women, Science and Reasoned Water Management in West Africa, established in 2009 at the University of Lomé, Togo

Source: https://en.unesco.org/themes/water-security/chairs

Water-related Field Office Networks:

- UNESCO Office in Nairobi-Water Scarcity
- UNESCO Office in Cairo-Hydrology Programme

Source: https://en.unesco.org/fieldoffice/cairo
Source: https://en.unesco.org/fieldoffice/nairobi
<table>
<thead>
<tr>
<th>Alignment with National, Regional and Continental Policy Agendas:</th>
<th>Global-Sustainable Development Agenda 2030 through the implementation of the SDGs in its work on:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Education 2030 agenda (SDG 4) is coordinated by UNESCO for the international community to achieve SDG 4 through partnerships, policy guidance, capacity development, monitoring and advocacy.</td>
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<tr>
<td></td>
<td>• Social and Human Sciences-UNESCO offers policy advice and capacity-building and makes a direct contribution to supporting Member States in achieving SDGs 10,11 and 16, and indirectly contributes to supporting Member States in implementation of SDGs 3, 4 and 13.</td>
</tr>
<tr>
<td></td>
<td>• Culture</td>
</tr>
<tr>
<td></td>
<td>• Communication and Information-UNESCO promote peaceful and inclusive societies, ensuring public access to information and protecting fundamental freedoms, contributing to SDG 16. Additionally, through the promotion of universal access to information, including Open Solutions, UNESCO contributes directly to SDG 9.</td>
</tr>
<tr>
<td></td>
<td>• Sustainable Development Goals for Ocean through the Intergovernmental Oceanographic Commission of UNESCO contributing to the monitoring of SDG 14, some IOC activities, also strengthen efforts to achieve SDGs 2-5 and 8.</td>
</tr>
</tbody>
</table>

Source: https://en.unesco.org/sustainabledevelopmentgoals
<table>
<thead>
<tr>
<th>Name:</th>
<th>Swedish International Development Agency (SIDA)</th>
<th>Website:</th>
<th><a href="https://www.sida.se/en">https://www.sida.se/en</a></th>
<th>Category:</th>
<th>Government</th>
</tr>
</thead>
</table>


| Mandate: | SIDA is a government agency of the Swedish Ministry for Foreign Affairs. SIDA is responsible for the organization of the bulk of Sweden's official development assistance to developing countries. Through cooperation with civil society, multilateral organisations, public agencies and the private sector SIDA works for sustainable development and helps create conditions for people living in poverty and oppression to improve their living conditions.

The objective of Sweden's international development cooperation is to create conditions to improve the lives of people living in poverty and oppression. Sweden's development cooperation is based on the principles of aid and development effectiveness, the 2030 Agenda, the Addis Ababa Action Agenda and the Paris Agreement. Sweden's feminist foreign policy will guide the activities.

Within the African Regional cooperation, SIDA supports regional actors that contribute to cooperation between countries and promote sustainable development on the African continent through bilateral, regional and thematic strategies. | Source: https://www.sida.se/en/about-sida/how-we-are-governed |

In relation to Water and Sanitation, SIDA contributes to increasing access to clean water and toilets and improving opportunities for people to take care of their hygiene. | Source: https://www.sida.se/en/sidas-international-work/water-and-sanitation |
**Strategic Objectives:**
SIDA has bilateral development cooperation with approximately 35 countries in Africa, Asia, Latin America and Europe. SIDA also works regionally in Africa, Asia, the Middle East and North Africa, as well as Europe, and supports organisations that contribute to poverty reduction globally. SIDA is guided by a selection of strategies, namely

- Bilateral strategies (Burkina Faso, Ethiopia, Mozambique, Somalia, Sudan, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe)
- Regional strategies (Sub-Saharan Africa and Middle East and North Africa)
- Thematic strategies

Source: https://www.sida.se/en/about-sida/how-we-are-governed

In the context of this report, will focus on regional support to Africa with the following strategic thematic areas in the region:

- Climate, resilience and renewable energy.
- Democracy, gender equality, and political and human rights.
- Economic integration, employment and migration
- Human security and freedom from violence
- Sexual and reproductive health and rights.


In relation to SIDA’s work with water and sanitation collaborates with other organisation to improve water and sanitation across the globe, in Africa specifically:

- Increasing access to sanitation by providing more people with access to clean water and toilets through partnership UNICEF and Multi-donor trust fund Global Water Security and Sanitation Partnership (GWSP).
- Running water at health clinics in Uganda-through collaboration with UNICEF, SIDA provide running water to health clinics in Uganda and many other countries.
- Better toilets in rural Kenya-In cooperation with Water Sector Trust Fund, SIDA


**Alignment with National, Regional and Continental Policy Agendas:**
SIDA’s collaboration with partners

International:
1. United Nations Sustainable Development Goals: Through Strategy for Sweden’s global development cooperation in the areas of environmental sustainability, sustainable climate and oceans, and sustainable use of natural resources 2018-2022, SIDA’s strategy draws on SDGs to contribute to normative, global policy and methods development towards SDGs 6, 7 and 11-15. Furthermore, SIDA’s contribution to supporting the 2030 Agenda is through contribution towards capacity development, collaboration and partnership.


And

Continental:

2. African Union-through Regional Economic Communities (RECs), SIDA has contributed to initiatives on increasing opportunities for countries to coordinate their economic policies and facilitated trade.

Regional:

3. Sweden’s Development Cooperation with the Middle East and North Africa (MENA) aims to counteract the fundamental causes of conflict and contribute to favourable developments in the region. The initiatives are expected to contribute:
   a. Strengthened democracy, gender equality and greater respect for human rights
   b. Environmental improvement, reduced climate impact and increased resilience to environmental impacts, climate change and natural disasters (focus on water resources, renewable energy and food security)
   c. Improved opportunities for regional economic development as a prerequisite for enabling poor people to improve their living conditions.


4. The African Climate Policy Centre (ACPC) works to ensure that countries implement national climate plans and reduce their climate impact based on the signed Paris Agreement
5. SIDA in collaboration with the IGAD Drought Disaster and Sustainability Initiative (IDDRSI) which works to enable countries and communities to build a better resilience to natural disasters and climate change, supports the Horn of Africa region which is regularly hit by severe drought, threatening people’s livelihoods, health and lives as we as countries’ economic development.
6. SIDA supports initiatives and works of Afrobarometer which maps people’s experiences of democracy and political governance in 37 countries with surveys that help make citizens’ views and priorities visible and can be used as a basis for political decision-making.
7. The African Union’s Committee on the Rights of the Child, collaborates with various children’s rights organisations to strengthen the protection of children’s rights in areas such as armed conflict, early marriage and the right to education.
8. The African Development Bank is working to increase funding opportunities for small- and mid-size enterprises (SMEs), thus increasing employment among young people.
9. Through the World Customs Organisation (WCO), SIDA is contributing to modernise customs administration and supports the countries of the region in implementing the WTO’s Trade Facilitation Agreement, which aims to simplify trade around the world.
10. In cooperation with Lund University, Trade Policy Training Centre in Africa (Trapa), educates students from Sub-Saharan Africa in trade policy and commercial law, in order to increase expertise about trade issues.
11. The African Union’s Joint Labour Migration Programme (JLMP) develops policies aimed at improving labour migration on the continent which SIDA supports to improve labour migration in the continent.
12. SIDA supports peace process in the Horn of Africa, northern Mozambique and the Sahel region through:
a. The African Union and regional institutions such as Ecowas, SADC and EAC in the prevention, management and resolution of conflicts.

b. The United Nations, through civil society organisations and national authorities in addressing the root causes of the conflicts and counteracting violent extremism.

13. Together with UNESCO, SIDA provides comprehensive sexuality education to 20 million pupils in the region.

14. The organisations Population Services International (PSI) and DKT international offer contraceptives and medical abortions in 11 African countries which is supported by SIDA to improve sexual and reproductive health and rights.

15. Through the United Nations Population Fund (UNFPA) and UNICEF, SIDA supports the world’s largest anti-genital mutilation programme (covering 16 African countries), which works to address social norms about gender equality play and its preventative work reaches missions of girls who receive protection and access to healthcare.

<table>
<thead>
<tr>
<th>Name:</th>
<th>South African National Research Foundation (SA-NRF)</th>
<th>Website:</th>
<th><a href="https://www.nrf.ac.za">https://www.nrf.ac.za</a></th>
<th>Category:</th>
<th>Governmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Pretoria, South Africa</td>
<td>Geographical scope:</td>
<td>National</td>
<td></td>
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</table>

**Mandate:**
To promote and support research through funding, human resource development and the provision of the necessary facilities to facilitate the creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge and thereby strengthen the relationship between science and society to contribute to the improvement of the quality of life of all the people of the Republic.

**Strategic Objectives:**
Strategic objectives of the NRF over the next decade are:
- Promote globally competitive research and innovation
- Enhance strategic international engagements
- Provide best practice systems in support of grant-making, reviews and evaluations
- Establish and maintain research infrastructure and platforms
- Grow NRF influence, impact and reputation
- Optimise return on investment
- Entrench science engagement
- Improve talent management

**Alignment with National, Regional and Continental Policy Agendas:**
National policies:
- National Development Plan: Vision 2030
- White Paper on Science, Technology and Innovation, 2019

Government policies and strategies:
- The Strategy for Human Capacity Development for Research, Innovation and Scholarships
- The Staffing of South Africa’s Universities Framework
- The Science Engagement Framework
- The Research Outputs Policy
- The South African Research Infrastructure Roadmap
- The Ministerial Guidelines for Improving Equity and the Distribution of DSI/NRF Bursaries and Fellowships; and
- Discipline-specific strategies and plans that include astronomy, marine biology, biotechnology, palaeosciences and nanotechnology

International:
- the African Union’s Agenda 2063
- Science, Technology and Innovation Strategy for Africa, 2024
- Sustainable Development Goals of the United Nations
**WatSanNet – AFRICA STUDY**

<table>
<thead>
<tr>
<th>Name:</th>
<th>USAID</th>
<th>Website:</th>
<th><a href="https://www.usaid.gov">https://www.usaid.gov</a></th>
<th>Category:</th>
<th>Foreign Policy, Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Washington DC, United States</td>
<td>Geographical scope:</td>
<td>Global, regional reach in Africa, Asia, Europe and Eurasia, Latin America and the Caribbean and the Middle East</td>
<td></td>
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<tr>
<td>Mandate:</td>
<td>USAID leads international development and humanitarian efforts to save lives, reduce poverty, strengthen democratic governance and help people progress beyond assistance. Specifically, to Africa, the USAID has a longstanding commitment to engage African countries early and often as partners in pursuing their shared interests and values such as security, global health, climate change, freedom and democracy and shared prosperity. Additionally have an interest in Africa's success and sustainable development and to be partners in creating climate-friendly trade that secures good livelihoods for both African and American workers.</td>
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<tr>
<td>In relation to water and sanitation, US Government developed the global water strategy which aims to reduce diseases and save lives, eradicate poverty, and promote sustainable economic growth, increase food and energy security, build peace and security, and open up international markets to US technologies and approaches.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Source:</td>
<td><a href="https://www.usaid.gov/where-we-work">https://www.usaid.gov/where-we-work</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Objectives:</td>
<td>Our objective is to support partners to become self-reliant and capable of leading their development journeys. We make progress toward this by reducing the reach of conflict, preventing the spread of pandemic disease, and counteracting the drivers of violence, instability, transnational crime and other security threats. We promote American prosperity through investments that expand markets for U.S. exports; create a level playing field for U.S. businesses; and support more stable, resilient, and democratic societies. We stand with people when disaster strikes or crisis emerges as the world leader in humanitarian assistance.</td>
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<tr>
<td>In partnership with Africa, the USAID strategically prioritises the following:</td>
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<tr>
<td>• Boost agriculture productivity through the Feed the Future Initiative</td>
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</tbody>
</table>
In relation to water and sanitation, USAID under the US Government Global Water Strategy, the following strategic objectives will advance the vision of the strategy, these objectives are:

- Promote sustainable access to safe drinking water and sanitation services, and the adoption of key hygiene behaviours.
- Encourage the sound management and protection of freshwater resources.
- Reduce conflict by promoting cooperation on shared waters.
- Strengthen water sector governance, financing, and institutions.

Source: [https://www.globalwaters.org/sites/default/files/Global%20Water%20Strategy%202017%20final%20508v2.pdf](https://www.globalwaters.org/sites/default/files/Global%20Water%20Strategy%202017%20final%20508v2.pdf)

In addition to supporting the Global Water Strategy, USAID Centre for Water Security, Sanitation and Hygiene (WSSH) supports the Globalwaters.org aim to foster global knowledge and collaboration for sustainable water, sanitation and hygiene access for all, and providing water practitioners with the latest news, learning and resources from USAID and partners.

### Alignment with National, Regional and Continental Policy Agendas:

<table>
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<th>Continental</th>
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<tbody>
<tr>
<td>1. African Union-Agenda 2063-The United States’ program has overarching goals of supporting the African Union in its strategic development objectives including areas such as health, democracy and governance, education, trade and women’s empowerment. Source: <a href="https://www.usaid.gov/african-union">https://www.usaid.gov/african-union</a></td>
</tr>
<tr>
<td>2. Power Africa-in partnership with USAID brings together the world’s top companies, political leaders, and financial institutions to help overcome Africa’s energy crisis. By using collective problem-solving connecting the African population to the electricity grid. <a href="https://www.usaid.gov/powerafrica/aboutus">https://www.usaid.gov/powerafrica/aboutus</a></td>
</tr>
<tr>
<td>3. Prosper Africa-The USAID is one of the participating partners committed to the initiative that brings together services and resources from across the US Government to empower business with market insights, deal support and solutions to strengthen business climates. Additionally, the USAID programs facilitate access to new markets and investment and provide US and African businesses with a wide range of services, including matchmaking, due diligence and support meeting international quality standards and certification requirements. Source: <a href="https://www.usaid.gov/prosperafrica">https://www.usaid.gov/prosperafrica</a></td>
</tr>
</tbody>
</table>
4. Africa Trade and Investment programme is a US government initiative aiming to increase two-way trade and investment between African nations and the US.


Regional:

Through the USAID water programming, the Agency’s many country missions across Africa with five regional missions:

5. West Africa Regional—through the USAID West Africa Mission, the water and sanitation activities target rural areas where water supply and sanitation services are inadequate. Through capacity building initiatives, USAID selected three regional universities as focal points for WASH training:
   a. The International Institute for Water and Environmental Engineering (Burkina Faso)
   b. University of Niamey (Niger)
   c. University for Development Studies in Tamale (Ghana)

6. USAID provide support to the African Water Association through the African Water Association Institutional Capacity Building Program, whose mandate is to improve sanitation and drinking water supply, additionally share knowledge and best WASH practices in West Africa.

Source: https://www.globalwaters.org/WhereWeWork/Africa/west-africa-regional

7. SAHEL Regional—USAID programs take place in coordination with, and oversee from the Sahel Regional Office in Dakar (Senegal). Local and international development specialists, USAID representatives coordinate development activities in-country with oversight by the:
   a. USAID/West Africa Regional Mission in Accra (Ghana)
   b. USAID’s Office of Foreign Disaster Assistance (OFDA)
   c. Food for Peace (FFP) regional offices (Senegal)
   d. Resilience in the Sahel Enhanced (RISE)

Source: https://www.globalwaters.org/WhereWeWork/Africa/sahel-regional

8. Central Africa Regional Program for the Environment (CARPE)—a land management program in Africa aiming to preserve the Congo Basin’s ecosystem. Through the Congo Basin Forest Partnership, USAID’s contribution brings together member states, donor agencies, international organisations, NGOs, scientific institutions and private sector representatives. The 48 members share the commitment to enhance communication and coordination among the members to create synergies between their respective projects, programs and policies.

Source: https://www.usaid.gov/central-africa-regional

9. East Africa Region
   The USAID supports regional institutions, including the East African Community (EAC), the Common Market for Easter and Southern Africa (COMESA), the Intergovernmental Authority on Development (IGAD) and their member states to address issues that require collaboration between countries.

Source: https://www.usaid.gov/east-africa-regional
10. Southern Africa Regional-the USAID/SA's strategic goal is to advance the region toward becoming more integrated, prosperous and ultimately self-reliant. USAID program increases trade and strengthens regional economic ties, addresses the HIV/AIDS crisis, mitigates food insecurity and supports democratic processes.

| Name: | Federal Ministry of Education Research (BMBF) |
| Website: | http://www.bmbf.de/ |
| Category: | Governmental-Funding |
| Head Office/Secretariat: | Berlin, Germany and Bonn |

**Geographical scope:** International, National

**Mandate:**
The BMBF has many different tasks at the national level within the framework of its responsibilities under the Basic Law. They include: - Legislative, policy and coordination tasks for non-school initial and continuing vocational training, - Research promotion, - Legislation on training assistance and the funding thereof (in conjunction with the Länder), - The promotion of gifted school students, trainees and students and the fostering of young scientific talent. - The promotion of international exchanges of trainees, students, persons taking part in continuing education, instructors as well as scientists

Source: https://www.bmbf.de/bmbf/en/home/home_node.html

The BMBF created the Africa Strategy, which provides a framework for establishing and developing contacts and partnerships with African partner institutions. Furthermore, strengthens cooperation with African partners in areas that sustainably create, preserve and improve people’s livelihoods through the German-Africa cooperation in education, science and research.

Source: https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/pdf/the-africa-strategy-of-the-bmbf.pdf?__blob=publicationFile&v=2

**Strategic Objectives:**
The BMBF Strategy is pursuing three main goals:

- Further advance the internationalisation of education, science and research. The BMBF's Africa Strategy offers the German science community a reliable framework for establishing and developing contacts and cooperation with African partners institutions.
- With the methods and instruments of education, science and research, BMBF wants to boost prospects and sustainable development opportunities in Africa to a greater extent. The Africa Strategy provides fresh impetus for a better joint future.
- Looking to add a new dimension to cooperation by increasingly focusing on synergies in keeping with the German Federal Government's strategy for the Internationalisation of Education, Science and Research. BMBF’s Africa Strategy helps ensure coherence in the cooperation with Africa.

To achieve these goals, BMBF has identified five areas of action:
1. Promote knowledge transfer and innovation, contribute to growth and prosperity, and improve economic prospects in our African partner countries.
2. Support higher education and junior researchers to improve individual life prospects.
3. Strengthen the employability of university graduates and make vocational education and training (VET) more practice-oriented.
4. Committed to ensuring that research collaboration increasingly contributes to implementing the United Nations Sustainability Development Goals (SDGs).
5. Exploit potential synergies at the national, European and international level

Source: [https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/pdf/the-africa-strategy-of-the-bmbf.pdf?__blob=publicationFile&v=2](https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/pdf/the-africa-strategy-of-the-bmbf.pdf?__blob=publicationFile&v=2)

<table>
<thead>
<tr>
<th>Alignment with National, Regional and Continental Policy Agendas: International:</th>
</tr>
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<tbody>
<tr>
<td>1. United Nations Sustainable Development Goals-through action area 4, BMBF aims to use education, research and innovation are key drivers for sustainable development and through the implementation of the Agenda 2030 address SDGs by:</td>
</tr>
<tr>
<td>a. Strengthen research collaboration with African partners specifically in areas that create and maintain sustainable livelihoods for people locally and promote resilience (SDGs 1 and 2)</td>
</tr>
<tr>
<td>b. Implementation of research on health products and services with product development partnerships, the European and Developing Countries Clinical Trials</td>
</tr>
<tr>
<td>2. The BMBF plays an active part in international organizations (Organisation for Economic Co-operation and Development (OECD), UNESCO and the United Nations, aiming to take advantage of the individual activities of these organizations to generate an added value for the objectives and international priorities of the Federal Ministry of Research.</td>
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<tr>
<th>Continental:</th>
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<tbody>
<tr>
<td>1. African Union’s Agenda 2063-the five action areas in the Africa Strategy reflect priorities and measures in the African Union’s Agenda 2063.</td>
</tr>
<tr>
<td>2. Continental Education Strategy for Africa 2016-2025</td>
</tr>
<tr>
<td>3. Continental Strategy for Technical and Vocational Education and Training</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The BMBF provides funding for key transregional (Middle-East and Africa) initiatives in fields of health, climate change, nutrition and capacity building</td>
</tr>
<tr>
<td>3. Research Networks for Health Innovations in sub-Saharan Africa networks are networks coordinated by local African researchers and focus on combating diseases that pose a particular risk to people on the African continent. The research networks will strengthen the healthcare systems in the African partner countries over the long term.</td>
</tr>
<tr>
<td>4. The Pan-African Institute for Mathematical Sciences (AIMS) centres operating in South Africa, Senegal, Ghana, Cameroon, Tanzania and Rwanda support excellent young researchers though master’s degrees. Furthermore, research chairs at AIMS centres follow international standards</td>
</tr>
</tbody>
</table>
via the Alexander von Humboldt Foundation (AvH). Additionally, thought research chairs at AIMS in Ghana, South Africa, Cameroon and Tanzania, the German Academic Exchange Service (DAAD) implements measures to promote cooperation with German universities that directly supports the chairs, creating lasting ties, and providing funding for doctoral students and post-doctoral positions. BMBF aims to increase this funding includes Rwanda, Ghana and Senegal.

5. The Pan-African University Institute of Water and Energy Sciences (PAUWES) in Algeria is an initiative supported by both the Federal Ministry for Economic Cooperation and Development (BMZ) and the BMBF focusing on the research development with a research agenda in cooperation with the institute as well as African and German experts.


6. The BMBF also funds the Arab-German Young Academy (AGYA) of Sciences and Humanities (based in Egypt) brings together Arab and German scholars to address common challenges and develop solutions through sustainable research cooperation. Additionally, AGYA promotes early-career scholars from 22 countries (Arab and German) while implementing joint research projects and initiatives at the interference of science and society with a focus on education, innovation and science policy.

Source: [https://agya.info/about-us/mission-goals](https://agya.info/about-us/mission-goals)

11. WASCAL-West African Regional Science Service Centre on Climate Change and Adapted Land-Use is a large-scale research-focused centre by strengthening the research infrastructure and capacity in West Africa with expertise from ten West African countries and Germany.

Source:


<table>
<thead>
<tr>
<th>Name:</th>
<th>Economic Social Research Council, Natural Environment Research Council, United Kingdom Research and Innovation (UKRI)</th>
<th>Website:</th>
<th><a href="https://www.ukri.org">https://www.ukri.org</a></th>
<th>Category:</th>
<th>Research and Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/Secretariat:</td>
<td>Swindon and London, England</td>
<td>Geographical scope:</td>
<td>Local, national (UK) and international researchers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mandate:**

The United Kingdom Research and Innovation is a body that works in partnership with universities, research organisations, businesses, charities and government to create best possible environment for research and innovation to flourish. Vision is for an outstanding research and innovation system in the UK that allows everyone to contribute and to benefit, enriching lives locally, nationally and internationally.

The Natural Environment Research Council (NERC) is one of the nine UKRI councils, and is the driving force of investment in environmental science in the UK.

Source: https://nerc.ukri.org/about/whatwedo/activities/

**Strategic Objectives:**

Their mission is to convene, catalyse and invest in close collaboration with others to build a thriving, inclusive research and innovation system that connects discovery to prosperity and public good by:

The UKRI will deliver on its mission based on the four elements set out in its corporate plan:

- to convene and catalyse by listening to and connecting diverse communities to create new combinations, and working in partnership with others
- to incentivise the development of a research and innovation system that realises its vision via its choices, policies and behaviour
- to invest in people, ideas and infrastructure
- to conduct high-quality research and innovation
**Name:** Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT)  
**Website:** https://www.mext.go.jp/en/  
**Category:** Government

<table>
<thead>
<tr>
<th>Head Office/Secretariat</th>
<th>Geographical scope:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo, Japan</td>
<td>International and National</td>
</tr>
</tbody>
</table>

**Mandate:**  
To realize the concept of lifelong learning prescribed in the Basic Act on Education, MEXT and consists of eight police bureau, however, in the context of the report will only focus on three:

- Higher Education Bureau
- Planning promotion of higher education focusing on undergraduate and graduate schools
- Research Promotion Bureau
- Promoting academic and basic research in universities and advancing science and technology corresponding to policy issues.
- Research and Development Bureau
- Conducting large-scale research and development in the fields of space, nuclear power, oceans, environment and energy, and earthquakes and disaster prevention

**Strategic Objectives:**

- Higher Education Bureau
  - Improving undergraduate and graduate schools
  - Scholarship Programmes
  - Promoting private schools
  - Promoting the internationalization of Universities and Two-way student exchanges
- Research Promotion Bureau
  - Promoting Academic and basic research
  - Promoting research and development in life sciences
  - Promoting research and development in Information Science and Technology
  - Promoting research and development in Nanotechnology and materials science
  - Promoting research and Development in the fields of elementary particles and nuclear physics
- Research and Development Bureau
  - Promoting Research and development in the space and aviation fields
  - Promoting research and development in the nuclear energy field
  - Promoting research and development in the environment and energy fields
  - Promoting research and development in the earthquake and disaster prevention fields
### Alignment with National, Regional and Continental Policy Agendas:

<table>
<thead>
<tr>
<th>International:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. UNESCO</td>
</tr>
</tbody>
</table>

Source: [https://www.mext.go.jp/en/about/organization/index.htm](https://www.mext.go.jp/en/about/organization/index.htm)

### National:
- The Third Basic Plan for the Promotion of Education is based on the Basic Act on Education, Japan.
- The Fourth Basic Plan to Promote Children’s Reading
- Basic Act for Gender-Equal Society
- Government’s Basic Plan for Gender Equality
- Convention on the Rights of Persons with Disabilities
<table>
<thead>
<tr>
<th>Name:</th>
<th>National Natural Science Foundation of China (NSFC)</th>
<th>Website:</th>
<th><a href="http://www.nsfc.gov.cn/english/site_1/index.html">http://www.nsfc.gov.cn/english/site_1/index.html</a></th>
<th>Category:</th>
<th>Research and Innovation-Funding Agency and Governmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Haidian District, Beijing, China</td>
<td>Geographical scope:</td>
<td>International (regional)-partners in 49 countries and regions.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mandate:

The NSFC is responsible for directing, coordinating and making effective use of the national natural science fund to support basic research and stimulate free exploration, identify and foster scientific talents, as well as to promote progress in science and technology and the harmonious socioeconomic development for the nation (China).

The mission of support to basic research, foster talented researchers, develop international cooperation and promote socioeconomic development.

Source: [https://www.nsfc.gov.cn/english/site_1/about/6.html](https://www.nsfc.gov.cn/english/site_1/about/6.html)

Through the International (Regional) Cooperation and Exchange Program, the NSFC provide support for researchers involved in NSFC-funded projects, with an international cooperation and exchange relationship with 94 science funding organisations and research institutions in 49 countries and regions.

### Strategic Objectives:

Therefore, three major reform tasks were identified to fulfil the mission of the NSFC for a period of 5-10 years, namely:

- Identifying funding categories with the ultimate goal to give timely support to new ideas and concepts which provide concrete solutions to meaningful scientific problems. These categories are: research of creative and timely ideas, research focusing on frontiers’ of science in unique ways, application-driven basic research and transdisciplinary leading-edge research.

- Improve evaluation mechanisms through an appropriate review process needed for the identified categories which will include a setup of peer-review mechanism featuring Responsibility, Credibility and Contribution (RCC) based on active participation of scientists to improve the accuracy, fairness and performance in supporting basic research.

- Improve the layout of research areas in accordance with the inherent logic and landscape of the knowledge system.

Source: [https://www.nsfc.gov.cn/english/site_1/about/6.html](https://www.nsfc.gov.cn/english/site_1/about/6.html)

### Alignment with National, Regional and Continental Policy Agendas:

National Natural Science Fund from the Central Government, China.

International:

1. 93 Cooperative Agreements or MoUs with partners in 49 countries and regions.
2. National-Ministry of science and Technology (MOST)
### Name:
Consultative Group on International Agricultural Research (CGIAR)

### Website:
https://www.cgiar.org

### Category:
Research and Innovation

### Head Office/Secretariat:
Montpellier, France

### Geographical scope:
International and regional: Six regions: Latin America and the Caribbean (LAC), Central and West Asia and North Africa (CWANA), West and Central Africa (WCA), East and Southern Africa (ESA), South Asia (SA) and South East Asia and the Pacific (SEA)

### Mandate:
CGIAR Visions a world with sustainable and resilient food, land and water systems that deliver diverse, healthy, safe, sufficient, and affordable diets, and ensure improved livelihoods and greater social equality, within planetary and regional environmental boundaries.

Through the CGIAR Research Program on Water, Land and Ecosystems (WLE) which is a collaboration between CGIAR Research Centres, Food and Agriculture Organization of the United Nations, RUAF Foundation and several national, regional and international partners, the program provide evidence and solutions on natural resource management to influence decision makers in governments, international development organizations and financiers. This program is led by the International Water Management Institute (IWMI).

### Strategic Objectives:
Its mission is to deliver science and innovation that advance the transformation of food, land, and water systems in a climate crisis.

CGIAR research and innovation will:
- Achieve positive measurable benefits across five SDG-focused impact areas, namely
  - Nutrition, health, and food security
  - Poverty reduction, livelihoods and jobs
  - Gender Equality, youth and social inclusion
  - Climate adaptation and mitigation
  - Environmental health and biodiversity
- By scaling research and innovation through the following impact pathways:
  - Capacity development
  - Innovations
  - Policy
- Which will be delivered through regional and global CGIAR initiatives across six regions: Latin America and the Caribbean (LAC), Central and West Asia and North Africa (CWANA), West and Central Africa (WCA), East and Southern Africa (ESA), South Asia (SA) and South East Asia and the Pacific (SEA)
- These initiatives will draw on global, best in class, capabilities and ways of working through actions areas such as:
  - Systems Transformation
  - Resilient Agrifood Systems
  - Genetic innovation
- Through ways of working in:
  - Systems Transformation
  - Strategic Alliances
Multiple Pathways  
Risk and Resilience  
Innovative Finance  
Digital Revolution

- Collaborating closely with partners in all research and innovation for impact.

In terms of the CGIAR water plan, the following Flagship Programs are as follows:

- International Center for Tropical Agriculture (CIAT, now the Alliance of Bioversity International)
- International Crops Research Institute for Semi-Arid Tropics (ICRISAT), International Water Management Institute
- International Water Management Institute (IWMI), RUAF Global Partnership on Sustainable Urban Agriculture and Food Systems.
- International Food Policy Research Institute (IFPRI), IWMI
- Bioversity International (the Alliance)

Source: CGIAR Research Program on Water, Land Ecosystems (2021)

### Alignment with National, Regional and Continental Policy Agendas:

<table>
<thead>
<tr>
<th>National policies:</th>
<th>Regional</th>
<th>Global or multi-country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock Mater Plan adopted by Ethiopian Government</td>
<td>CGIAR for a regional Climate Smart Agriculture strategy for Central America. (</td>
<td>CGIAR research and capacity development</td>
</tr>
<tr>
<td>Inform investment to provide grid-connected solar irrigation pumps to farmers and farmer cooperatives y the Indian government.</td>
<td>National and regional policy dialogue has led to new policies for one-stop border posts being established in sub-Saharan Africa (so far, in four key border posts involving eight countries)</td>
<td></td>
</tr>
<tr>
<td>National agroforestry concession legislation enabling land and tree rights that underpin livelihoods for 120 000 households at the Amazon forest frontier in Peru</td>
<td></td>
<td>The World Food Programme (WFP)</td>
</tr>
<tr>
<td>Private companies in Uganda, implementation of modified procedures to facilitate registration of outgrower contracts in women’s names (Kakira Sugar Limited) and improve access to bank accounts for women (Tropical Bank)</td>
<td></td>
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</tr>
<tr>
<td>Inclusion of Conservation Agriculture based sustainable intensification in national extension package in Ethiopia.</td>
<td></td>
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<tr>
<td>Vietnam’s food systems are evolving rapidly, making food safety a high priority for the government. CGIAR mobilized, produced, and/or contributed to a range of initiatives supporting a shift in food safety policy to a more efficient and equitable risk-based inspection and monitoring system bolstered by compliance incentives.</td>
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</table>

Alignment with Sustainable Development Goals UN Targets national, regional and international policies through research outputs.
<p>| | | |</p>
<table>
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<tbody>
<tr>
<td>o Forest Stewardship Council. (Reported by FTA)</td>
<td>o The European Union designed a trade policy relating to agreements with African Regional Economic Communities.</td>
<td></td>
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<tr>
<td><strong>Name:</strong></td>
<td>Bill and Melinda Gates Foundation</td>
<td><strong>URL:</strong></td>
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</tr>
<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>Headquarters: Seattle, Washington, United States</td>
<td><strong>Geographic scope:</strong></td>
</tr>
<tr>
<td><strong>Mandate:</strong></td>
<td>Our mission is to create a world where every person has the opportunity to live a healthy, productive life.</td>
<td></td>
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<tr>
<td><strong>Strategic Objectives:</strong></td>
<td>We focus on issues we think are the biggest barriers that prevent people from making the most of their lives. For each issue we work on, we fund innovative ideas that could help remove barriers. Some of the projects we fund will fail. We not only accept that, we expect it—because we think an essential role of philanthropy is to make bets on promising solutions that governments and businesses can't afford to make. As we learn which bets pay off, we adjust our strategies and share the results so everyone can benefit.</td>
<td></td>
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<tr>
<td></td>
<td>• Gender Equality</td>
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<td></td>
<td>• Global Development</td>
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<td></td>
<td>• Global Health</td>
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<tr>
<td></td>
<td>• Global Policy and Advocacy</td>
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<tr>
<td>Name:</td>
<td>International Foundation for Science</td>
<td>Website:</td>
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</tr>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Stockholm, Sweden</td>
<td>Geographical scope:</td>
</tr>
<tr>
<td>Mandate:</td>
<td>FS's has a Vision of LLMIC scientists assuming ownership and development of local and regional research agendas and contributing to a global research community committed to supporting sustainable development and building science literacy</td>
<td></td>
</tr>
<tr>
<td>Strategic Objectives:</td>
<td>The IFS Mission is to secure resources and draw on its extensive global network of reviewers, scientific advisors, alumni and Secretariat to enhance the capacity of promising early-career women and men scientists in LLMICs to acquire the skills necessary to:</td>
<td></td>
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<td></td>
<td>• conduct original research that relates to genuine problems and generates fundamental and/or applicable scientific knowledge that can be put to use;</td>
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<td></td>
<td>• contribute to science literacy;</td>
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<td></td>
<td>• communicate their results to the public at large, including scientists, politicians and policy makers, donors and private interest groups;</td>
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<tr>
<td></td>
<td>• influence science priority setting; and</td>
<td></td>
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<tr>
<td></td>
<td>• network and collaborate with the global research community to shape research agendas, both local and global.</td>
<td></td>
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<tr>
<td><strong>Name:</strong></td>
<td>French National Research Agency (ANR)</td>
<td><strong>Website:</strong></td>
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</tr>
<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>Paris, France</td>
<td><strong>Geographical scope:</strong></td>
</tr>
<tr>
<td><strong>Strategic Objectives:</strong></td>
<td>It also aims to <strong>strengthen the position of French research</strong> at the European level and worldwide. The Agency's missions, defined in the decree of 1 August 2006 amended on 24 March 2014, are:</td>
<td></td>
</tr>
</tbody>
</table>
## Name:
African Development Bank (AfDB)

## Website:
- [https://www.afdb.org/en](https://www.afdb.org/en)

## Category:
Financial

## Head Office/Secretariat:
Abidjan, Côte d’Ivoire

## Geographical scope:
Continental, Regional African countries, And non-regional countries from across the globe.

## Mandate:
Overall, the AfDB strategy is designed to place the Bank at the centre of Africa’s transformation and to improve the quality of Africa’s growth. It aims to broaden and deepen the process of transformation, mainly by ensuring that growth is shared and not isolated, for all African citizens and countries, not just for some. It also aims to bring about growth that is not just environmentally sustainable but also economically empowering.

When growth is inclusive as well as “green”, it creates the jobs that the continent needs now and that it will need in ever greater numbers as millions more young people enter the job market, with energies and aspirations to match.

The AfDB consists of 13 sectors to fulfil its mandate, one of the sectors is Water and Sanitation. The Water and Sanitation sector’s mandate is “to contribute to the sustainable economic development and social progress of its regional members individually and jointly”.


## Strategic Objectives:
The overarching objective of the African Development Bank (AfDB) Group is to spur sustainable economic development and social progress in its regional member countries (RMCs), thus contributing to poverty reduction.

The Bank Group achieves this objective by:

- mobilizing and allocating resources for investment in RMCs; and
- providing policy advice and technical assistance to support development efforts.

Under the water and sanitation sector, the Bank Group mandate developed a vision which has poverty reduction and development as a central goal, therefore, strategic plan which gives water high priority was developed. The strategy will:

- Increase water supply and sanitation financing
- Focus primarily on poorest 65% of population living in rural areas
- Provide some support for peri-urban areas, small and medium town and specifically for urban sanitation
- Promote transboundary water resources management
- Support the enabling environment to attract more resources

### Alignment with National, Regional and Continental Policy Agendas:

<table>
<thead>
<tr>
<th>International:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New Water Policy—provides general framework for African Development Bank Group's water sector. Has strong causal relationship between water security and economic growth, investment in the water sector are key for sustainable development and inclusive growth, leading to realisation of multiple SDGs:</td>
<td></td>
</tr>
<tr>
<td>• Clean water and sanitation (SDG 6)-most explicit related goal</td>
<td></td>
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<tr>
<td>• Elimination of poverty (SDG 1)</td>
<td></td>
</tr>
<tr>
<td>• Zero hunger (SDG 2)</td>
<td></td>
</tr>
<tr>
<td>• Good health and well-being (SDG 3)</td>
<td></td>
</tr>
<tr>
<td>• Gender Equality (SDG 5)</td>
<td></td>
</tr>
<tr>
<td>• Clean Energy (SDG 7)</td>
<td></td>
</tr>
<tr>
<td>• Decent work and Economic Growth (SDG 8)</td>
<td></td>
</tr>
<tr>
<td>Source: <a href="https://www.afdb.org/en/documents/policy-water">https://www.afdb.org/en/documents/policy-water</a></td>
<td></td>
</tr>
<tr>
<td>2. Sanitation and Wastewater Management Atlas of Africa- highlights the human health and ecosystem impacts of poor sanitation and wastewater management; and discusses the continent's policy and institutional arrangements. Furthermore, benchmarks Africa’s progress towards the Sustainable Development Goals (SDGs), Africa’s Agenda 2063 and Africa’s Water Vision 2025. The findings of the atlas will allow policymakers to track progress on sanitation and wastewater, making it a valuable tool to accelerate change.</td>
<td></td>
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<tr>
<td>Continental:</td>
<td></td>
</tr>
<tr>
<td>1. Integrated Water Resources Management Policy (2000)- central objective is to promote an integrated approach in management of water resources in order to achieve sustained economic development and attain goals poverty reduction in Regional Member Countries (RMC)s.</td>
<td></td>
</tr>
<tr>
<td>2. African Water Vision 2025-Action should be taken at the level of subregional economic commissions of Africa-wide organizations. The priority actions that need to be taken include awareness- and consensus-building, creation of enabling environments for international cooperation, responding to immediate water problems, creating frameworks for integrated water resources management and capacity-building.</td>
<td></td>
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<tr>
<td>3. African Union Agenda 2063- The Bank has made several contributions to Agenda 2063, showing its ongoing commitment to the preparation and</td>
<td></td>
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</tbody>
</table>
finalization of Agenda 2063 and the first ten-year implementation plan, particularly through the creation of the joint technical team for monitoring and evaluating Agenda 2063. This team is made up of members of the African Union Commission, the United Nations Economic Commission for Africa, the African Development Bank, the RECs, the African Capacity Building Foundation, the New Partnership for Africa's Development and the African Union Development Agency (AUDA-NEPAD).


- Water Partnership Program (WPP)
- Rural Water Supply and Sanitation Initiative (RWSSI)
- Hosting of African Water Facility (AWF)

Regional:

- Greater Horn of Africa- complements the Country Water Sector Profiles of seven nations (Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan and Uganda)-examines the dimensions through which the risks and impacts will be felt most strongly in the future. These include water quantity, water quality, and water accessibility.

Source: (Olet, Guene, Kayondo, Chanda, 2020)
Name: World Bank
URL: https://www.worldbank.org/en/home
Category: Intergovernmental

Head Office/Secretariat: Washington DC, United States of America
Geographical scope: Global through international institutions at regional and global levels reaching 189 countries through its partner institutions:
- The International Bank for Reconstruction and development (IBRD)
- The International Development Association (IDA)
- The International Finance Corporation (IFC)
- The Multilateral Investment Guarantee Agency (MIGA)
- The International Centre for Settlement of Investment Disputes (ICSID)

Mandate:
The World Bank Group works in every major area of development across the globe. It provides a wide array of financial products and technical assistance, and help countries share and apply innovative knowledge and solutions to the challenges they face through their five institutions (IBRD, IDA, IFC, MIGA and ICSID) working for sustainable solutions that reduce poverty and build shared prosperity in developing countries (Source: The World Bank Group, 2021; https://www.worldbank.org/en/who-we-are)

The Worldbank together with its partners launched the Global Water Security and Sanitation Partnership (GWSP). The GWSP aims to provide action equal to the ambition articulated within the Sustainable Development Goals (SDGs).

Strategic Objectives:
At the heart of the new Strategy are the two goals endorsed by the World Bank Group’s Board of Governors at the 2013 Spring Meetings:
- To end extreme poverty: reduce the percentage of people living on less than $1.25 a day to 3 percent by 2030.
- To promote shared prosperity: foster income growth for the bottom 40 percent of the population in every developing country.

Source: https://openknowledge.worldbank.org/bitstream/handle/10986/16093/32813_ebook.pdf?sequence=

The GWSP primarily identified five priority themes where action is critically needed to achieve the SDGs for water to, these themes also form the GWSP’s mission, namely:
- Sustainability
- Institutions
- Financing
• Inclusion and
• Resilience.


<table>
<thead>
<tr>
<th>Alignment with National, Regional and Continental Policy Agendas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment with The United Nations 2030 Agenda for Sustainable Development Goals:</td>
</tr>
<tr>
<td>• WBG works with client countries to deliver on 2030 agenda through finance, data and implementation by supporting country-led and country-owned policies to attain SDGs.</td>
</tr>
<tr>
<td>• Paris Climate Agreement at COP21</td>
</tr>
<tr>
<td>• Through the Multilateral Development Bank (MDB) Agreement (Addis Ababa Action Agenda)</td>
</tr>
</tbody>
</table>

The GWSP is a Multi-Donor Trust Fund housed within the World Bank’s Water Global Practice with support from: Australia’s Department of Foreign Affairs and Trade; Bill and Melinda Gates Foundation; Netherlands’ Ministry of Foreign Trade and Development Cooperation; Norway’s Ministry of Foreign Affairs; Rockefeller Foundation; Swedish International Development Cooperation Agency; Switzerland’s State Secretariat for Economic Affairs; Swiss Agency for Development & Cooperation; and UK Department for International Development.

The GWSP is fully aligned with the vision of the World Bank Group’s Water Global Practice - A Water Secure World for All. It is also fully embedded within the Water GP; an integrated and influential part of the World Bank architecture


**Name:** African Union Development Agency (AUDA) - NEPAD Networks of Water Centres of Excellence  
**URL:** [http://nepadwatercoe.org/](http://nepadwatercoe.org/)  
**Category:** Programmes and Networks  

<table>
<thead>
<tr>
<th>Head Office/Secretariat:</th>
<th>Geographical scope:</th>
</tr>
</thead>
</table>
| Stellenbosch South Africa | **AUDA-NEPAD Southern African Network of Water Centres of Excellence (AUDA-NEPAD SANWATCE):**  
- Stellenbosch University (South Africa) – as the hub and secretariat of the AUDA-NEPAD SANWATCE  
- International Centre for Water Economics and Governance in Africa, based at the University of Eduardo Mondlane (Mozambique) – Node  
- University of KwaZulu-Natal (South Africa) – Node  
- University of Western Cape (South Africa) – Node  
- University of Malawi (Malawi) – Node  
- University of Zambia (Zambia) – Node  
- University of Botswana (Botswana) – Node  
- The Council for Scientific and Industrial Research, CSIR (South Africa) – Node  
- The Namibia University of Science and Technology (Namibia)  
- The Zimbabwe National University of Science and Technology (Zimbabwe)  
- University of Mauritius (Mauritius)  
**AUDA-NEPAD Western African Network of Water Centres of Excellence (AUDA-NEPAD SANWATCE):**  
- University of Cheikh Anta Diop (Senegal) (Hub and secretariat of the Western African network)  
- International Institute for Water and Environmental Engineering (2iE) (Burkina Faso)  
- University of Benin (Nigeria)  
- National Water Resources Institute (Nigeria)  
- Kwame Nkrumah University for Sciences and Technology (Ghana)  
**AUDA-NEPAD Central/East African Network of Water Centres of Excellence (AUDA-NEPAD CEANWATCE):**  
- The Water Research Centre at the University of Khartoum, (Sudan)  
- The Ethiopian Institute of Water Resources at Addis Ababa University, (Ethiopia)  
- The Geography Geo-Informatics and Climatic Sciences department at Makerere University, (Uganda) |
Mandate:

The mandate of the AUDA-NEPAD Networks of Water Centres of Excellence is as follows:

- Facilitate and where applicable conduct selective research on water issues;
- Serve as a Higher Education (PhD; Post-Doc; Staff-Exchange) soundboard to the Regional Economic Communities on regional water matters;
- Collaborate with other networks and institutions in specialised areas;
- Setting the African-Regional water research agenda;
- Establish an African continental water research agenda that is populated from the African-regional water agendas.

During the 11th General Assembly of AMCOW of 2013 in Cairo, Egypt, where the AU/NEPAD Centres of Excellence was also mandated “to develop a Human Capacity Development Programme aimed at addressing junior professional and technician level capacity challenges in the water sector”. Decision: EXCO/11/2013/CAIRO/17.

In 2018/2019, a further decision was adopted by the AMCOW General Assembly which “directs the [AMCOW] Secretariat to work with the AUC and NEPAD Centres of Excellence to support the understanding of patterns of knowledge and skills demand and migration in order to both strengthen the resilience of the Africa’s Water Resources Sector at national and transboundary level; and promote Youth Employment.” Decision: GA/11/2018/LBV/7.

This can be achieved, amongst other means, through one-on-one engagement with AMCOW and AMCOST though the SADC Technical Advisory Committee, to observe political direction; engage in order to provide evidence-based research.

**SADC Regional Institutionalisation.**

During the annual meeting of the SADC Water Resource Technical Committee, held in Lusaka, Zambia in 2013, it was recommended, and subsequently adopted by the SADC Ministers of Water that:

- Approve the AU/NEPAD SANWATCE Business Plan (Section 5.2.9.7);
- Approve the proposal for AU/NEPAD SANWATCE to be the implementing agent for the Water Research Fund for Southern Africa (WARFSA 2.0), a programme of SADC Water Division (Section 5.2.9.8)
To further institutionalise the AU/NEPAD SANWATCE in the SADC region, the SADC Ministers responsible for Science, Technology and Innovation, Education and Training, held in Maputo, Mozambique (June 2014), ministers noted and supported the activities of the AU/NEPAD SANWATCE and called upon Member States to nominate institutions to form part of the Regional Network.

Co-operation with the European Commission

As a flagship programme of the AU/NEPAD, the Networks of Water Centres of Excellence have also been identified as key partner in the Joint Africa-EU Strategy (JAES), which provides a high-level co-operation platform for the EU and African partners.

Source: http://nepadwatercoe.org/about-us/our-mandate/

<table>
<thead>
<tr>
<th>Strategic Objectives:</th>
<th>The AUDA-NEPAD Water Centres of Excellence is formed by centres of research with specific goals that are to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Improve conservation and the use of the continent’s water resources,</td>
</tr>
<tr>
<td></td>
<td>• Improve the quality and the quantity of water available to rural and urban households,</td>
</tr>
<tr>
<td></td>
<td>• Strengthen national and regional capacities towards water resources management and to reduce impacts of water-related disasters, and</td>
</tr>
<tr>
<td></td>
<td>• Enlarge the range of technologies for water supply and to improve access to affordable quality water.</td>
</tr>
</tbody>
</table>

The strategic objectives are:

- **Research** - Research work undertaken that is focused on creation and development of new knowledge and technology.
- **Education and training** - Human resources to at least be developed through masters and doctoral degree programmes, postdoctoral support, internship programmes, supper for students to study abroad and joint ventures in student training (between higher education institutions involved with the AUDA-NEPAD Water CoE Consortium or otherwise.
- **Networking** - The AUDA-NEPAD Water CoE Consortium must actively collaborate with locally and internationally based individuals, groups and institutions that are reputable and knowledgeable in the research field. Equally, the AUDA-NEPAD Water CoE Consortium must negotiate and help realise national, regional, continental and international partnerships.
- **Information brokerage** - Knowledge held by AUDA-NEPA Water CoE Consortium of the research field should be made accessible by promoting knowledge sharing and knowledge transfer activities. To this end, the AUDA-NEPAD Water CoE Consortium must maintain contemporary knowledge in suitable databases and offer to interpret it for the benefit of appropriate users.
- **Service rendering** - The AUDA-NEPAD CoE Consortium provides information, analysis, policy and other services, including
| Alignment with National, Regional and Continental Policy Agendas: | As mentioned above the AUANEPAD Networks of Water Centres of Excellence was established by decision of the African Ministers responsible for Water and the ministers responsible for Science and Technology, implying alignment with the Agenda 2063, Africa Water Vision, and Regional and National Water and Sanitation policies and frameworks.  

In SADC the AUANEPAD SANWATCE specifically engage with SADC Water, and collaborating with WaterNet and Global Water Partnership Southern Africa (GWP-SA) developed the SADC Water Research Agenda to map the way forward regarding the development of SADC water research agenda.  

Source: [http://nepadwatercoe.org/resources/sadc-water-science-research-agenda/](http://nepadwatercoe.org/resources/sadc-water-science-research-agenda/) |
<table>
<thead>
<tr>
<th>Name: AfriAlliance</th>
<th>URL: <a href="https://afrialliance.org">https://afrialliance.org</a></th>
<th>Category: Programmes and Networks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat: Various offices</td>
<td>Geographical scope: Continental</td>
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</tbody>
</table>
| Mandate: | The AfriAlliance project aims to better prepare Africa for future climate change challenges by having African and European stakeholders work together in the areas of water innovation, research, policy and capacity development.  
The network consolidated existing partners of 16 EU and African partners consisting of scientists, decision makers, practitioners, citizens and other key stakeholders to form an effective, problem-focused knowledge sharing mechanism. The innovation platform coordinates the project, namely, the Africa-EU Innovation Alliance for Water and Climate.  
Source: https://afrialliance.org/about-afrialliance |  |  |
| Strategic Objectives: | The supporting networks of the AfriAlliance is supporting the existing networks in identifying appropriate social innovations and technological solutions for key water and climate change challenges. The water and climate change research and social innovation (R&I) cooperation between Africa and Europe is being reinforced through a combination of forward-looking and bottom-up innovation and road mapping techniques.  
AfriAlliance is also identifying demands, opportunities, and constraints at different level and develop strategic short-term demand-driven R & I outlook and long-term R&I agenda advice for improving Africa-EU collaboration.  
Source: https://afrialliance.org/about-afrialliance |  |  |
| Alignment with National, Regional and Continental Policy Agendas: | International:  
European Commission |  |  |
<table>
<thead>
<tr>
<th>Name:</th>
<th>WaterNet</th>
<th>URL: Sources:</th>
<th><a href="https://www.waternetonline.org/">https://www.waternetonline.org/</a></th>
<th>Category:</th>
<th>Programmes and Networks</th>
</tr>
</thead>
</table>

| Head Office/ Secretariat: | North West University, Mahikeng, South Africa (as from Jan 2022) | Geographical scope: | Regional: Southern Africa and Eastern Africa |

**Mandate:**

The WaterNet envisions a future in which the SADC and Eastern African Community region has the institutional and human capacity to educate and train its own water managers who are capable to contribute to the equitable sharing and sustainable utilisation of water resources for poverty alleviation, economic development (livelihood security) and environmental security.

Source: https://www.waternetonline.org/about/vision-and-mission

**Strategic Objectives:**

This vision is translated into the Mission of WaterNet to have a sustainable and deep impact upon institutional and human capacity in Southern and East Africa in the field of Integrated Water Resources Management (IWRM) through training, education, and research, by harnessing the complementary strengths of institutions in the region. The enhanced capacity should enable the peoples of Southern and East Africa to manage their water resources in a more efficient, equitable and sustainable manner.

WaterNet has been built around the following objectives to reach its strategy:

- To forge a strong, demand driven and sustainable network of universities and research institutions in Southern and East Africa in the field of IWRM.
- To deliver and strengthen the jointly owned regional Master degree programme in IWRM
- To develop and deliver demand-driven training and education for practicing water sector professionals in Southern and East Africa.
- To stimulate, regionalize and strengthen the research in the field of IWRM in Southern and East Africa.
- To raise awareness and understanding of IWRM and its implementation at local, national and trans-boundary scale.

Source: https://www.waternetonline.org/about/vision-and-mission

**Alignment with National, Regional and Continental Policy Agendas:**

Regional:

- WaterNet is a Subsidiary of SADC Water, thus aligned with the Southern African Development Community (SADC)-SADC Regional Strategic Action Plan on Integrated Water Resources Development and Management (RSAP).

Continental:

- African Minister’s Council on Water (AMCOW)-through the AMCOW Water, Climate and Development Programme referred to above and the Agricultural Water for Africa Partnership (AgWA), where WaterNet hosts the activities for Southern and East Africa and Chairs the Pan-African and Regional Steering Committees.
- Global Water Partnership (GWP)-South Africa-Implementation of IWRM is a key tool in the response to the region's climate change adaptation strategy for the water sector into all areas of the water sector programme in SADC.
- African Development Bank
- Africa Water Facility
- Development Bank Southern Africa (DBSA)
- AUDA-NEPAD

Source: https://www.waternetonline.org/about/partners
<table>
<thead>
<tr>
<th>Name:</th>
<th>Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL)</th>
<th>URL:</th>
<th><a href="https://www.sasscal.org">https://www.sasscal.org</a></th>
<th>Category:</th>
<th>Programmes and Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Windhoek, Namibia</td>
<td>Geographical scope:</td>
<td>Regional: Angola, Botswana, Namibia, South Africa, Zambia and Germany.</td>
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<tr>
<td>Mandate:</td>
<td>The centre is conceptualized and operationalised to complement the existing research and capacity development infrastructure and research initiatives in the region. The vision of the SASSCAL is to be a leading regional centre in integrated climate change and adaptive land management science services for improved quality of life in southern Africa. Source: <a href="https://www.sasscal.org/mission/">https://www.sasscal.org/mission/</a></td>
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<tr>
<td>Strategic Objectives:</td>
<td>SASSCAL’s mission is to strengthen the regional capacity to generate and use scientific knowledge products and services for decision-making on climate change and adaptive land management through research management, human capital development and services brokerage. To achieve the vision and mission, SASSCAL have the following strategic objectives: • To manage and coordinate research in adaptation to climate change and sustainable land management. • To provide products, service and information for decision-making • To contribute to the creation of a knowledge-based society through academic and non-academic capacity development programmes. Source: <a href="https://www.sasscal.org/mission/">https://www.sasscal.org/mission/</a></td>
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<tr>
<td>Alignment with National, Regional and Continental Policy Agendas:</td>
<td>Alignment with: Annual Report 2019 As highlighted by the reports of the Intergovernmental Panel on Climate Change (IPCC), underpinned by the previous United Nations Framework Convention on Climate Change Conferences of the Parties (UNFCCC COPs) agreements by signing the Paris Agreement, there is consensus among governments, decision-makers and researchers that climate change is an imminent threat to societies and the environment.</td>
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</tbody>
</table>
Regional:
Through Project partnership, SASSCAL aligns with mandates and agendas supporting partners regionally.


**Name:** Western African Science Service Centre for Climate Change and Adaptive Land Management (WASCAL)  
**URL:** [https://wascal.org](https://wascal.org)  
**Category:** Programmes and Networks

<table>
<thead>
<tr>
<th>Head Office/Secretariat:</th>
<th>Accra, Ghana</th>
<th>Geographical scope:</th>
<th>Regional: West Africa</th>
</tr>
</thead>
</table>

**Mandate:**

WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use) is a large-scale research-focused Climate Service Centre designed to help tackle this challenge and thereby enhance the resilience of human and environmental systems to climate change and increased variability. It does so by strengthening the research infrastructure and capacity in West Africa related to climate change and by pooling the expertise of ten West African countries and Germany. (Source: [https://wascal.org](https://wascal.org)). The mission is to provide information and knowledge at the local, national, and regional levels to its West African member countries experts to cope with the adverse impacts of climate change and devise integrated mid and long-term options to build up resilient and productive socio-ecological landscapes.

WASCAL is funded by the German Federal Ministry for Education and Research (BMBF) and the focus areas look at climate change, development, as well as technology and innovation. The research produced in West Africa helps Germany to improve livelihoods of West African people and adapt land management policies; this is led by knowledge expertise in Germany to aid in West African development towards climate change.

**Strategic Objectives:**

There are four main objectives of WASCAL that aim to identify resilience; adapt land use systems and develop functional ecosystems alongside supporting sustainable development. This is achieved through partnerships, strengthening skills and abilities, and assess land management policies. There is a strong regional focus on the well-being of West African people. The four objectives are:

1. To significantly improve on climate change research infrastructure and capacity in West Africa
2. To explore science-based scenarios and options for enhancing resilience in climate change
3. Assist decision-makers in the policy design of human and environmental systems, as well as supporting the social livelihoods of local people in West Africa
4. Help to educate future generations of scientists and policy makers towards climate-related issues, and policy discussions
Source: https://wascal.org/our-story/
| Name: | Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) |
| URL: | https://www.ruforum.org |
| Category: | Programmes and Networks |

| Head Office/ Secretariat: | Kampala, Uganda |
| Geographical scope: | Continental |

**Mandate:**

The Regional Universities Forum for Capacity in Agriculture (RUFORUM) is an association of 85 African universities operating within 35 countries across the African continent. RUFORUM supports universities in their role of providing support and economic development in small-scale farmers throughout the Sub-Saharan region. RUFORUM provides grants and programs to help support universities, and in turn small-scale farmers. (Source: https://www.ifpri.org/donor/regional-universities-forum-capacity-building-agriculture-ruforum).

The mandate of RUFORUM aims to strengthen the capacities of universities to foster innovative responses towards the demands of small-holder farmers. This is achieved through the training of high-quality researchers, the output of impact-orientated research and the maintenance of collaborative relations among governments, farmers, and national agricultural research institutions. The RUFORUM Vision 2030 envisions transformative and vibrant universities that is inclusive for agricultural development, and to feed and create prosperity for Africa.

**Strategic Objectives:**

There are five institutional and strategic objectives of RUFORUM:

1. Strengthen the capacity of locally-based researchers who respond to the needs and opportunities of farmers, for agricultural innovation as national development
2. Promote the retention of this capacity through farmer-employer demand
3. Develop collaborative research and training facilities that promote graduate education
4. Enhance participation and voice of women in agricultural research, production and marketing
5. Encourage the application of research training and outresearch to the reform of policy and development practice.

RUFORUM aims to achieve these five objectives through wide-range consultative prioritisation and consensus building process among member universities, and other actors from agricultural innovation in Africa. The overall guiding principle is proactive engagement with stakeholders in graduate
training, research and development processes. Therefore, there is a focus on graduate training as well as research and development processes.
The Pan-African University (or Pan African University) (PAU) is a post-graduate training and research network of university nodes in five regions, supported by the African Union. The Pan African University is an initiative of the Heads of State and Government of the African Union. It is a Premier continental university network whose mission is to provide quality postgraduate education geared towards the achievement of a prosperous, integrated and peaceful Africa. (Source: https://www.au-pau.org/submission/).

The core functions of the PAU's mandate consider the following:

- The reliance on sustainable funding by member states of the growth and development of PAU
- Enhanced governance structures based on a balance of autonomy and accountability that allows efficient operations
- Inclusive leadership with transparent and agile management processes and procedures
- The provision of state-of-the-art infrastructure, equipment, and database by PAU that enables cutting-edge research and training

There are five main thematic areas of PAU; namely, Basic Sciences, Technology and Innovation; Life and Earth Sciences (including Health and Agriculture), Governance, Humanities and Social Sciences; Water and Energy Sciences (including Climate Change); and Space Sciences.

There are seven strategic objectives for PAU:

1. Governance: to apply the PAU Governance Framework which highlights the delegated authority to Council, Rectorate and Institute level to ensure the implementation of the strategy
2. Management: for PAU institutions to deliver excellent and relevant outcomes
3. Financial sustainability: to grow and develop PAU based on sustainable funding
4. Infrastructure: to provide state-of-the-art infrastructure, equipment and databases
5. Research for development: to provide state-of-the-art developmental research and innovation in thematic areas of PAU institutes
6. Human capital development: to provide state-of-the-art developmental research and innovation in thematic areas of PAU institutes
7. Pan African integration, outreach, cooperation and transfer: to contribute to international knowledge transfer, exchange with academic policy, as well as private and
public sector advancing Pan African Integration and the African Development Agenda.

These strategic objectives can be seen in the Strategic Plan (2020-2024) that formulates three core functions. Firstly, the human resource development; secondly, research for development and thirdly, outreach and integration. The strategic objectives and Strategic Plan both aim to strengthen PAU's operations, that enhance the quality, relevance and reputation of the university (Source: [https://pau-au.africa/policies-frameworks/pau-strategic-plan-2020-2024](https://pau-au.africa/policies-frameworks/pau-strategic-plan-2020-2024))
<table>
<thead>
<tr>
<th>Name:</th>
<th>Cap-NET</th>
<th>URL:</th>
<th><a href="https://cap-net.org">https://cap-net.org</a></th>
<th>Category:</th>
<th>Programmes and Networks</th>
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</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Stockholm, Sweden</td>
<td>Geographical scope:</td>
<td>Global</td>
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<tr>
<td>Mandate:</td>
<td>The strength of Cap-Net lies with the vital partners and implementing members: our affiliated networks. The networks are autonomous, associations of experts and organisations, that have emerged globally as a strategic response to the demand for increased skills and capacities in the water sector, leading towards the implementation of integrated water resources management. (Source: <a href="https://cap-net.org">https://cap-net.org</a>)</td>
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<tr>
<td>Strategic Objectives:</td>
<td>Strategic directions are in eradicating poverty in all its forms and dimensions; accelerating structural transformations for sustainable development; and building resilience to crises and shocks. Its vision is “Water Knowledge for All: Empowering Individuals, Enabling Environments”. Mission is strengthened individual and institutional capacity, and knowledge base to formulate and implement relevant policies, laws and strategies at country, regional, water basin, and source-to-sea scales.</td>
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<tr>
<td><strong>Name:</strong></td>
<td>Climate Resilient Infrastructure Development Facility (CRIDF)</td>
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<tr>
<td><strong>URL:</strong></td>
<td><a href="https://cridf.net">https://cridf.net</a></td>
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<tr>
<th><strong>Head Office/ Secretariat:</strong></th>
<th>Pretoria, South Africa</th>
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<tr>
<td><strong>Geographical scope:</strong></td>
<td>Southern Africa</td>
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<tr>
<th><strong>Mandate:</strong></th>
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<tr>
<td>The Climate Resilient Infrastructure Development Facility (CRIDF) is a FCDO (Foreign, Commonwealth &amp; Development Office) supported programme working to provide long-term solutions to water issues that affect poor communities in Southern Africa. Our focus is not on building short-term water infrastructure, but on working with organisations to show them how they can better build and manage their own water infrastructure to improve people’s lives. Because rivers, lakes and river basins cross borders, CRIDF is working with 12 different countries in Southern Africa that share water resources. In so doing, CRIDF aims to improve the lives of over 200 million people, many of them extremely poor. (Source: <a href="https://cridf.net">https://cridf.net</a>)</td>
</tr>
</tbody>
</table>

CRIDF focuses on firstly, project preparation and delivery; secondly, stakeholder engagement and technical assistance; and thirdly, leveraging finance for project implementation. Key thematic areas of CRIDF are WASH, productive water (irrigation and hydropower), and integrated water resource management.

<table>
<thead>
<tr>
<th><strong>Strategic Objectives:</strong></th>
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<tr>
<td>The objective of CRIDF is to contribute to the peaceful and climate resilient management of shared water resources, for the benefit of the poor.</td>
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</table>

Main principles consider transboundary and regional focus, climate resilience, and pro-poor development with emphasis on women, children and vulnerable groups.
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<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Abidjan, Côte d'Ivoire</td>
<td>Geographical scope:</td>
<td>Continental</td>
</tr>
<tr>
<td>Mandate:</td>
<td>Africa Water Association (AfWA) is a continental organisation in water and sanitation, that brings together drinking water production and distribution companies, sanitation services companies, and regulators in African countries to share knowledge and best practices.</td>
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<tr>
<td>Strategic Objectives:</td>
<td>There are three missions for AfWA. Firstly, to coordinate the search for knowledge and latest development in the technical, legal, administrative and economic fields for Drinking water production, supply and of sanitation. Secondly, to promote the exchange of information on methods, processes and procedures of drinking water production and supply and sanitation. Thirdly, to initiate, encourage and promote any action of cooperation and exchange in professional training. (Source: <a href="https://www.afwa-hq.org/index.php/en/">https://www.afwa-hq.org/index.php/en/</a>).</td>
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<tr>
<td>Name:</td>
<td>Water Institute of Southern Africa (WISA)</td>
<td>URL:</td>
<td><a href="https://wisa.org.za/">https://wisa.org.za/</a></td>
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<tr>
<td>Head Office/ Secretariat:</td>
<td>Midrand, South Africa</td>
<td>Geographical scope:</td>
<td>Southern Africa</td>
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**Mandate:**

WISA members are continually striving to find effective and efficient ways to deliver excellent water services to everyone. This means doing the required research, learning from our water histories, and ensuring that the essential human capital is in place to action the change we need to achieve our water goals. We realise that it is up to us to collaborate on innovative and appropriate solutions that will make possible thriving cities that will be liveable for many decades to come. With the involvement of other southern African countries, we hold biennial conferences to bring together major players in the water sector. WISA wants to lead in strengthening strategic partnerships within the sector, while playing an active role in encouraging robust water discourse in the public domain. (Source: https://wisa.org.za/)

**Strategic Objectives:**

- Ensure that all Members experience WISA’s innovative and demand driven value proposition.
- Grow WISA’s strategic partnership with the sector.
- Grow WISA membership.
- Improve financial sustainability.
- Embed good corporate governance within WISA.
- Active role in the discourse of water in public domain.
### Name:
Global Water Partnership (GWP)

### URL:
https://www.gwp.org

### Category:
International Organisations

### Head Office/Secretariat:
Stockholm, Sweden  
GWP-SA Based in Pretoria, South Africa

### Geographical scope:
Global  
GWP-SA: Africa

### Mandate:
The vision of GWP is for a water secure world and its mission is to advance governance and management of water resources for sustainable and equitable development. The values of GWP are transparency, accountability, openness, inclusiveness, gender sensitivity, solidarity and respect. This is essential in the commitment towards the poor and disadvantaged.

Key thematic areas are transparent water cooperation, climate resilience through water, and water solutions for the Sustainable Development Goals. There is therefore a focus on awareness, facilitation and dialogue, resilience and sustainable management of water resources, as well as promoting systemic change (Source: https://www.gwp.org)

### Strategic Objectives:
Key objectives of the GWP consider the following:

1. Promote the principles, values and policies of GWP
2. Establish proactive alliances in water resource management that represents participation and gender sensitivity in the local, regional, and national level
3. Promote public participation in the management of water resources through capacity-building and information sharing at the local, regional, and national level
4. Promote Integrated Water Resource Management (IMRW) as the preferred approach in implementation
5. Align regions with hemispheric and other global water initiatives, international experiences and opportunities for regional capacity-building in IWRM.
6. Improve water governance through the promotion, enhancement and effective implementation of legislation, policy, programmes and institutional regulatory and administrative frameworks
7. Strengthen mechanisms for sharing information and experience (Source: https://www.gwp.org)

### Alignment with National, Regional and Continental Policy Agendas:
The GWP Network’s strategy Mobilising for a Water Secure World (2020-2025) is one of urgency, reflecting the gravity and extent of the world’s water crises. GWP prioritises opportunities where key global or regional policy frameworks seek to promote systemic changes – such as the 2030 Agenda (SDGs), the Paris Agreement
on Climate Change, the Sendai Agreement on Disaster Risk Reduction, and agreements shaping transboundary co-operation.
<table>
<thead>
<tr>
<th>Name:</th>
<th>International Water Management Institute Africa (IWMI)</th>
<th>URL:</th>
<th><a href="https://www.iwmi.cgiar.org">https://www.iwmi.cgiar.org</a></th>
<th>Category:</th>
<th>International Organisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Montpellier, France</td>
<td>Geographical scope:</td>
<td>Global</td>
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**Mandate:**

IWMI’s Vision reflected in its Strategy 2019-2023, is ‘a water-secure world’. The 2019-2023 Strategy responds directly to the demand for innovative, scientifically tested water management solutions for sustainable development. There is a global network of scientist operating in more than 30 countries. Research focuses on basin and regional scales, on science for a transformative agenda. IWMI works with governments, farmers, water managers, development partners and businesses to solve water problems and scale up solution (Source: https://www.iwmi.cgiar.org/about/who-we-are/).

There are three high priority areas in water challenges:

1. Food: to improve food security while sustainably managing water resources and ecosystems
2. Climate: to adapt and mitigate climate change while building resilience to water-related disasters and disruption
3. Growth: to reduce poverty and advance inclusion with equality as agriculture transforms, energy transitions, and urbanisation intensifies

Above all, the focus areas are building resilience, sustainable growth and rural-urban linkages

**Strategic Objectives:**

IWMI targets water and land management challenges faced by poor communities in developing countries. This is achieved by:

- Carry research into land and water management to improve food security
- Integrate climate change impacts on land and water management
- Generate and share knowledge to improve the management of water and land resources
- To act as a broker to form effective research alliances among partners in the South and North
- To actively promote the application of the knowledge it holds
- Identify the larger issues related to water management and food security that need to be understood and addressed by governments and policymakers
- Develop, test and promote management practices and tools that can be used by governments and institutions to manage water and land resources more effectively, and address water scarcity issues
- Clarify the link between poverty and access to water and to help governments and the research community better
understand the specific water-related problems of poor people
- Help developing countries build their research capacities to deal with water scarcity and related food security issues
(Source: https://www.devex.com)

| Alignment with National, Regional and Continental Policy Agendas: | Contributes towards the achievement of the Sustainable Development Goals (SDGs) of reducing poverty and hunger and maintaining a sustainable environment.  
(Source: https://www.iwmi.cgiar.org/about/who-we-are/) |
<table>
<thead>
<tr>
<th>Name:</th>
<th>International Water Association (IWA)</th>
<th>URL:</th>
<th><a href="https://iwa-network.org">https://iwa-network.org</a></th>
<th>Category:</th>
<th>International Organisations</th>
</tr>
</thead>
</table>
| Head Office/ Secretariat: | London, United Kingdom | Geographical scope: | Global | Mandate: | Our Mission  
To inspire change and service IWA members, the community of professionals concerned with water, external organisation and opinion leaders in being the international reference and global source of knowledge, experience and leadership for sustainable urban and basin-related water solutions.  
IWA programmes develop research and projects focused on solutions for water and wastewater management; we organise world-class events that bring the latest science, technology and best practice to the water sector at large; we work to place water on the global political agenda and to influence best practice in regulation and policy making; and we do this via the IWA’s global membership. (Source: https://iwa-network.org) |
| Strategic Objectives: | • Connecting People: We bring people of the highest calibre together to share knowledge, experience and know-how about the most pressing water challenges and innovative solutions.  
• Pioneering Science: We contribute to water science and technology by stimulating leading edge science and inventions, and helping scientists connect to their peers, publish their latest findings and help others learn with them.  
• Innovating Technology: We offer support and recognition to innovators in the world of water as technological innovations are key to changing the future of water.  
• Leading Practice: We develop and promote best practices and international frameworks and standards, supporting transitions to sustainable practices. (Source: https://iwa-network.org) |
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<tr>
<th><strong>Name:</strong></th>
<th>EC Joint Research Centre</th>
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<td><strong>URL:</strong></td>
<td><a href="https://ec.europa.eu/info/departments/joint-research-centre_en">https://ec.europa.eu/info/departments/joint-research-centre_en</a></td>
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<td>International Organisations</td>
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<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>Ispra, Italy</td>
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<td><strong>Geographical scope:</strong></td>
<td>Continental – Europe</td>
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**Mandate:**

- create, manage and make sense of knowledge to support European policies with independent evidence
- develop innovative tools and make them available to policy makers
- anticipate emerging issues that need to be addressed at EU level and understand policy environments
- share know-how with EU countries, the scientific community and international partners
- contributes to the overall objective of Horizon 2020
- conduct Euratom-funded research on nuclear safety and security to contribute to the transition to a carbon-free economy

(Source: [https://ec.europa.eu/info/departments/joint-research-centre_en](https://ec.europa.eu/info/departments/joint-research-centre_en))
<table>
<thead>
<tr>
<th><strong>Name:</strong></th>
<th>WaterAID</th>
<th><strong>URL:</strong></th>
<th><a href="https://www.wateraid.org/us/">https://www.wateraid.org/us/</a></th>
<th><strong>Category:</strong></th>
<th>International Organisations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>New York, NY, USA</td>
<td><strong>Geographical scope:</strong></td>
<td>Global</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mandate:</strong></td>
<td>WaterAid transforms lives by improving access to clean water, hygiene and sanitation in the world’s poorest communities. We work with local partners and influence decision-makers to maximise our impact.</td>
<td></td>
<td></td>
<td>(Source: <a href="https://www.wateraid.org/us/">https://www.wateraid.org/us/</a>)</td>
<td></td>
</tr>
<tr>
<td>Name: African Ministers' Council on Water (AMCOW)</td>
<td>URL: <a href="https://amcow-online.org">https://amcow-online.org</a></td>
<td>Category: Regional and Continental bodies</td>
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</tr>
<tr>
<td>Head Office/ Secretariat: Abuja, Nigeria</td>
<td>Geographical scope: Continental</td>
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<tr>
<td>Mandate: The African Ministers' Council on Water (AMCOW) was formed in 2002 in Abuja Nigeria. The mission of AMCOW is to provide political leadership, policy direction and advocacy in the provision, use and management of water resources for sustainable social and economic development and maintenance of African ecosystems. The mission of AMCOW is to promote cooperation, security, social and economic development, and poverty eradication among member states through the effective management of Africa’s water resources and provision of water supply services in a bid to realize the 2025 Africa Water Vision. (Source: <a href="https://amcow-online.org">https://amcow-online.org</a>)</td>
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</tbody>
</table>
| Strategic Objectives: The prime objective of AMCOW is to promote cooperation, security, social, economic development and poverty eradication among member states through the effective management of the continent’s water resources and provision of water supply services. Other objectives include:  
  - keep the state of Africa's water under review and promote desirable actions of common interest to Africa  
  - facilitate regional and international co-operation through the co-ordination of policies and actions amongst African countries regarding water resources issues  
  - support trans-national co-operation on water related issues through development of common positions on matters of global concern as well as co-operation in implementation of relevant conventions and international agreements  
  - encourage mechanisms that will promote best practices in water policy reforms, integrated water resources management, food security, water supply and sanitation and also assist in delivery in National regional and sub-regional programmes  
  - promote participation in regional studies regarding climate changes, develop observation networks, encourage information exchange and setup strategies for the management of water resources in time of drought and floods and develop policies and strategies of arresting the water crisis in Africa; and keep under review and constantly seek to strengthen the financing of water sector in Africa. (Source: https://enb.iisd.org/africa/water/amcow/amcow.html) |
**Alignment with National, Regional and Continental Policy Agendas:**

The AMCOW institutional set-up consists of a Full Council of Ministers (the minister responsible for water from each member country), an Executive Committee with a President/Chair (presently Uganda). The Executive Committee is composed of three representatives/water ministers from each of the 5 sub-regions (AMCOW member states are divided into five sub-regions: West Africa, Eastern Africa, Central Africa, North Africa and Southern Africa). Each sub-region has a sub-regional Secretariat (usually housed in the respective Regional Economic Community) for co-ordination of sub-regional activities. Each sub-region is headed by a Vice President. The main AMCOW Secretariat is in Abuja, Nigeria and is headed by an Interim Executive Secretary and support staff. The Executive Committee is advised by a Technical Advisory Committee (TAC). The Executive Committee ensures that decisions of the council are implemented and is responsible for the development of work programs/budgets for approval by the council, mobilizes the necessary financing and supervises the work of the secretariat.
<table>
<thead>
<tr>
<th>Name:</th>
<th>Africa River Basin Organisations (ANBO)</th>
<th>URL:</th>
<th><a href="http://www.anbo-raob.org/en">http://www.anbo-raob.org/en</a></th>
<th>Category:</th>
<th>Regional and Continental bodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Dakar, Senegal</td>
<td>Geographical scope:</td>
<td>Continental - Africa</td>
<td></td>
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<tr>
<td>Mandate:</td>
<td>ANBO's mission, in a context of climate change where Africa is particularly affected through a drastic reduction of water resources, is to Create synergies around the network Facilitate Structural Policy Development Processes on Water and Sanitation Promote IWRM Share knowledge and information Mobilize and pool financial resources and Attend AMCOW Strengthen cooperation with other similar networks In a nutshell, ANBO's mission is as follows: Support African Basin Organizations in developing their capacity to play a leading role in sustainable regional economic development, promoting investment and cooperative water management and strengthening cooperation and exchange of knowledge experiences between their members. (Source: <a href="https://www.anbo-raob.org/index.php/en">https://www.anbo-raob.org/index.php/en</a>)</td>
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<tr>
<td>Strategic Objectives:</td>
<td>Initially, the Network was set up with two main objectives as follows: • Promote the integrated management of water resources in river basins, lakes and aquifers as an essential tool for sustainable development • Establish a regional framework to support and exchange experiences and expertise among members for enhanced dialogue, harmonization and coordination of water management policies, strategies and practices. Current objectives: • The institutional, resources mobilization, technical and knowledge sharing capacity of ANBO, as a pillar under AMCOW, is strengthened; • The organizational structure and legal basis of the existing Basin Organizations are strengthened and the creation of new Basin Organizations is supported; • The investment planning, resources mobilization, and implementation capacity of the Basin Organizations is strengthened on the basis of cooperation and exchange of experiences among its members; • The data, information and knowledge management capacity to support transboundary water resources management is strengthened; (Source: <a href="https://www.anbo-raob.org/index.php/en">https://www.anbo-raob.org/index.php/en</a>)</td>
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<tr>
<td>Alignment with National, Regional and Continental Policy Agendas:</td>
<td>AMCOW</td>
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</tbody>
</table>
### AGRHYMET

**Name:** AGRHYMET  
**URL:** [http://agrhymet.cilss.int/](http://agrhymet.cilss.int/)  
**Category:** Regional and Continental bodies

<table>
<thead>
<tr>
<th>Head Office/Secretariat:</th>
<th>Niamey, Niger</th>
<th>Geographical scope:</th>
<th>Regional – Sahel</th>
</tr>
</thead>
</table>

**Mandate:** Inform and train on food security, the fight against desertification and water control in the Sahel and West Africa.

**Strategic Objectives:**

- Its main objective is the contribution to achieving food security and increased agricultural production in the CILSS (Permanent Interstate Committee for Drought Control in the Sahel) member States and the improvement natural resources management in the Sahelian region.

- To help improve the management of natural resources in the Sahel region and West Africa by providing information and training for development actors and their partners in the fields of agroecology in the broad sense (agro-climatology, hydrology, plant protection, etc.). It is a regional tool, specializing in sciences and techniques applicable to the sectors of agricultural development, rural spatial planning and natural resource management.

(Source: [https://www.un-spider.org/agrhymet-regional-centre](https://www.un-spider.org/agrhymet-regional-centre))
<table>
<thead>
<tr>
<th>Name:</th>
<th>OMVS - Senegal River Basin Development Organization</th>
<th>URL: <a href="http://www.omvs.org/">http://www.omvs.org/</a></th>
<th>Category:</th>
<th>Regional and Continental bodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Dakar, Senegal</td>
<td>Geographical scope:</td>
<td>Regional - Senegal River Basin. Guinea, Mali, Mauritania, and Senegal</td>
<td></td>
</tr>
<tr>
<td>Mandate:</td>
<td>The objective assigned to it is to achieve food self-sufficiency for the populations of the basin, to secure and improve the incomes of the populations of the valley, to preserve the balance of the ecosystems in the basin, to reduce the vulnerability of the economies of the Member States of organization in the face of climate change and finally, accelerating the economic development of member states. (Source: <a href="http://www.omvs.org/content/le-fleuve-s%C3%A9n%C3%A9gal">http://www.omvs.org/content/le-fleuve-s%C3%A9n%C3%A9gal</a>)</td>
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<tr>
<td>Name:</td>
<td>SADC Water Division</td>
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<tr>
<td>URL:</td>
<td><a href="https://www.sadc.int/themes/natural-resources/water/">https://www.sadc.int/themes/natural-resources/water/</a></td>
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<tr>
<td>Category:</td>
<td>Regional and Continental bodies</td>
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<tr>
<td>Head Office/Secretariat:</td>
<td>Gaborone, Botswana</td>
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<td></td>
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<tr>
<td>Geographical scope:</td>
<td>Southern Africa</td>
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</table>

**Mandate:**
The Water Division falls under the Directorate for Infrastructure and Services and is responsible for coordinating and facilitating the implementation of regional water related activities in close collaboration with the member states of SADC under the guidance of the Revised Protocol on Shared Watercourses (2000), which was first ratified in 1988 and revised in 2000.

**Overall Goal**
To contribute to the improvement of the quality of life of people in the SADC region through promoting co-operation in all water matters in the region for sustainable and equitable development, proper usage, and management of water resources.

**Strategic Objectives:**
To ensure that water in Southern Africa becomes a sustainable resource through the coordinated management, protection, and equitable use of its shared watercourses. Three strategic areas, Water governance, Infrastructure development and Water management.

<table>
<thead>
<tr>
<th><strong>Name:</strong></th>
<th>National Institutes of Health (NIH)</th>
<th><strong>URL:</strong></th>
<th><a href="https://www.nih.gov">https://www.nih.gov</a></th>
<th><strong>Category:</strong></th>
<th>Governmental</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>Bethesda, Maryland, USA</td>
<td><strong>Geographical scope:</strong></td>
<td>National - USA</td>
<td></td>
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</tbody>
</table>

**Mandate:**

The National Institutes of Health (NIH), a part of the U.S. Department of Health and Human Services, is the nation’s medical research agency — making important discoveries that improve health and save lives. NIH’s mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability. (Source: https://www.nih.gov)

**Strategic Objectives:**

The goals of the agency are:

1. to foster fundamental creative discoveries, innovative research strategies, and their applications as a basis for ultimately protecting and improving health;
2. to develop, maintain, and renew scientific human and physical resources that will ensure the Nation's capability to prevent disease;
3. to expand the knowledge base in medical and associated sciences in order to enhance the Nation's economic well-being and ensure a continued high return on the public investment in research; and
4. to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science. (Source: https://www.nih.gov)
<table>
<thead>
<tr>
<th><strong>Name:</strong></th>
<th>UN-Water Action Hub</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URL:</strong></td>
<td><a href="https://wateractionhub.org">https://wateractionhub.org</a></td>
</tr>
<tr>
<td><strong>Category:</strong></td>
<td>Governmental</td>
</tr>
<tr>
<td><strong>Head Office/Secretariat:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Geographical scope:</strong></td>
<td>Global</td>
</tr>
<tr>
<td><strong>Mandate:</strong></td>
<td>The Water Action Hub raises awareness, catalyzes collaboration, and scales critical lessons on water sustainability and climate resilience around the world.</td>
</tr>
<tr>
<td><strong>Strategic Objectives:</strong></td>
<td>The Hub helps companies and other organizations address water risk, advance sustainable water management, and build resilience by:</td>
</tr>
<tr>
<td></td>
<td>• Raising awareness of sustainability projects around the world and the organizations administering them</td>
</tr>
<tr>
<td></td>
<td>• Allowing organizations to propose new projects and garner interest among potential partners</td>
</tr>
<tr>
<td></td>
<td>• Facilitating new partners and collective action</td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>French Development Agency</td>
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</tr>
<tr>
<td><strong>Head Office/ Secretariat:</strong></td>
<td>Paris, France</td>
</tr>
</tbody>
</table>

**Mandate:** The Agence Française de Développement (AFD) Group funds, supports and accelerates the transition to a fairer and more sustainable world. Focusing on climate, biodiversity, peace, education, urban development, health and governance. It works to tackle poverty and promote sustainable development which is achieved by financing and supporting projects that improve living conditions for populations through economic growth and environmental protection.
<table>
<thead>
<tr>
<th><strong>Name:</strong></th>
<th>Institut de recherche pour le développement (IRD)</th>
<th><strong>URL:</strong></th>
<th><a href="https://en.ird.fr/node/8">https://en.ird.fr/node/8</a></th>
<th><strong>Category:</strong></th>
<th>International Research and Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head Office/Secretariat:</strong></td>
<td>Marseille, France</td>
<td><strong>Geographical scope:</strong></td>
<td>Regional - Mediterranean and Intertropical zones</td>
<td><strong>Mandate:</strong></td>
<td>It takes an original approach to research, expertise, training and knowledge-sharing for the benefit of countries and regions, making science and innovation key drivers in their development. (Source: <a href="https://en.ird.fr/our-identity">https://en.ird.fr/our-identity</a>)</td>
</tr>
<tr>
<td><strong>Strategic Objectives:</strong></td>
<td>Indeed, IRD's chief ambition is to build the ESR (Higher Education for Research) capacities of its partner countries. This serves a dual purpose: to contribute to advances in universal science, and to meet the needs of the countries' populations, particularly the most vulnerable ones. (Source: <a href="https://en.ird.fr/our-identity">https://en.ird.fr/our-identity</a>)</td>
<td><strong>Alignment with National, Regional and Continental Policy Agendas:</strong></td>
<td>IRD sets its priorities in line with the Sustainable Development Goals (SDGs) adopted by the United Nations in September 2015, to steer development policies. Combining critical analysis into the implementation of these goals, IRD seeks to tackle the challenges facing us today: global, environmental, economic, social and cultural changes that affect the whole planet. (Source: <a href="https://en.ird.fr/our-identity">https://en.ird.fr/our-identity</a>)</td>
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<tr>
<td>Name:</td>
<td>French agricultural research and cooperation organization (CIRAD)</td>
<td>URL:</td>
<td><a href="https://www.cirad.fr/en">https://www.cirad.fr/en</a></td>
<td>Category:</td>
<td>International Research and Innovation</td>
</tr>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Paris, France</td>
<td>Geographical scope:</td>
<td>Global</td>
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<tr>
<td>Mandate:</td>
<td>CIRAD is the French agricultural research and cooperation organization working for the sustainable development of tropical and Mediterranean regions. CIRAD works with its partners to build knowledge and solutions and invent resilient farming systems for a more sustainable, inclusive world.</td>
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</tbody>
</table>
| Strategic Objectives: | **Science is central to our operations**  
CIRAD conducts useful, targeted research to ensure change and impact on every scale of sustainable development, from smallholders to public policy. CIRAD has chosen to focus its research on six main fields:  
- Biodiversity – biodiversity as a lever of development and resilience  
- One Health – an integrated animal, plant and ecosystem health approach, in connection with public health  
- Agroecological transitions – developing agroecological transition engineering  
- Food systems – supporting the transition to more sustainable, inclusive food systems  
- Climate change – helping all farming systems in the global South adapt to climate change  
- Territories – territory-based approaches to leverage sustainable, inclusive development. | |
<p>| Alignment with National, Regional and Continental Policy Agendas: | It mobilizes science, innovation and training in order to achieve the Sustainable Development Goals. |</p>
<table>
<thead>
<tr>
<th>Name:</th>
<th>Welcome Trust</th>
<th>URL: <a href="https://wellcome.org/">https://wellcome.org/</a></th>
<th>Category:</th>
<th>Philanthropy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/</td>
<td>London, United</td>
<td>Geographical scope: Global</td>
<td></td>
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<tr>
<td>Secretariat:</td>
<td>Kingdom</td>
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</tbody>
</table>

**Mandate:**

We support discovery research into life, health and wellbeing, and we're taking on three worldwide health challenges: mental health, infectious disease and climate and health. (Source: [https://wellcome.org/who-we-are/strategy](https://wellcome.org/who-we-are/strategy))

**Strategic Objectives:**

We will achieve this vision in different ways, giving researchers the freedom to make discoveries that change the way we see the world, and using science to find solutions for three of the world’s most urgent health challenges.

We'll support a broad programme of discovery research across a wide range of disciplines with the potential to make important and unanticipated discoveries about life, health and wellbeing – both to help us tackle these great challenges, and to inspire further improvements in human health.

And we're developing programmes of work that draw on Wellcome's expertise across science, innovation and society to deliver ambitious goals:

- Mental health: Working with people who have lived experience of mental health issues to improve research, understanding and treatment of mental health.
- Infectious disease: Working with communities affected by escalating infectious diseases to bring those diseases under control and stop epidemics.
- Climate and health: Working with the communities most affected by climate change to explore the harmful effects of global heating on health, and to use research to develop new ways of protecting people’s health. (Source: [https://wellcome.org/who-we-are/strategy](https://wellcome.org/who-we-are/strategy))
<table>
<thead>
<tr>
<th>Name:</th>
<th>SADC Groundwater Management Institute (SADC-GMI)</th>
<th>URL:</th>
<th><a href="https://sadc-gmi.org">https://sadc-gmi.org</a></th>
<th>Category:</th>
<th>Research Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Bloemfontein, South Africa</td>
<td>Geographical scope:</td>
<td>Regional - SADC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandate:</td>
<td>SADC-GMI’s core mandate is to promote sustainable groundwater management and provide solutions to groundwater challenges across the SADC region. Four strategic objectives are key in achieving the SADC-GMI mandate.</td>
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</tbody>
</table>
| Strategic Objectives: | • Strengthen the SADC GMI  
• Improve knowledge management  
• Build national and regional institutional capacity  
• Lead national and regional coordination |
<table>
<thead>
<tr>
<th>Name:</th>
<th>Southern African Development Bank</th>
<th>URL:</th>
<th><a href="http://www.dbsa.org">http://www.dbsa.org</a></th>
<th>Category:</th>
<th>Financial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Johannesburg, South Africa</td>
<td>Geographical scope:</td>
<td>Regional - SADC</td>
<td></td>
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<tr>
<td>Mandate:</td>
<td>To advance the development impact on the African continent by expanding access to development finance and effectively integrating and implementing sustainable development solutions to:</td>
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<tr>
<td></td>
<td>• Improve the quality of life of people through the development of social infrastructure.</td>
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<td></td>
<td>• Support economic growth through investment in economic infrastructure.</td>
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<td></td>
<td>• Support regional integration.</td>
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<td></td>
<td>• Promote sustainable use of scarce resources.</td>
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<tr>
<td>Strategic Objectives:</td>
<td>DBSA has collected over three decades’ worth of experience in driving transformational change through multi-faceted investments for different types of infrastructure development. Our experience has resulted in us creating sound strategic objectives to lead us towards reaching our key mandates.</td>
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<td>• Sustained growth in developmental impact – aggressively growing businesses to maximise developmental impact.</td>
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<td></td>
<td>• Integrated infrastructure solutions provider – partner of choice for infrastructure development solutions.</td>
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<td></td>
<td>• Financial sustainability – maintain profitability and operational efficiency to enable growth in equity and fund developmental activities.</td>
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<td></td>
<td>• Sustainability innovations – instigate the formation of a new generation of special purpose vehicles and structured financial instruments that will facilitate and catalyse the mobilisation of investments in infrastructure development projects.</td>
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<tr>
<td></td>
<td>(Source: <a href="https://www.dbsa.org/about-us/our-strategy">https://www.dbsa.org/about-us/our-strategy</a>)</td>
<td></td>
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</tbody>
</table>

(Source: https://www.dbsa.org/about-us/our-strategy)
<table>
<thead>
<tr>
<th>Name: Rural Water Supply Network (RWSN)</th>
<th>URL: <a href="https://www.rural-water-supply.net/en/">https://www.rural-water-supply.net/en/</a></th>
<th>Category: Programmes and Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head Office/ Secretariat:</strong> St. Gallen, Switzerland</td>
<td><strong>Geographical scope:</strong> Global</td>
<td></td>
</tr>
</tbody>
</table>
| **Mandate:** | **Strategic Objectives:** \n**Leave No-one Behind**
To develop practical responses to the SDG mandate to leave no-one behind, recognising that the causes of exclusion include physical, attitudinal and institutional barriers, and that realisation of human rights to water and sanitation for the most marginalised requires a focus on power relations.

**Sustainable Groundwater Development**
Groundwater resources are properly assessed and sustainably developed and managed for drinking water supply and other uses, so ensuring their long term quality and security.

**Sustainable Services**
Rural water supply services are adequately financed, meet country service delivery standards, are managed and supported by capacitated service providers and service authorities.

**Self-supply**
1) The potential and limitations of Supported Self-supply as a service delivery approach for rural water supply is understood and recognized by government agencies, development partners, water users and other key actors.
2) The approach of Supported Self-supply is applied where appropriate.

**Mapping & Monitoring**
Decision-making for ensuring sustainable rural water services (e.g. resource allocation, external support) is evidence based and uses information generated by robust data.

<p>| <strong>Alignment with National, Regional and Continental Policy Agendas:</strong> | To develop practical responses to the SDG mandate to leave no-one behind. The ambitious Sustainable Development Goal 6 and the legal duties under the Human Right to Water can only be achieved through strong partnerships at all levels from local to global. |</p>
<table>
<thead>
<tr>
<th>Name:</th>
<th>JICA (Japan International Cooperation Agency)</th>
<th>URL:</th>
<th><a href="https://www.jica.go.jp/english/">https://www.jica.go.jp/english/</a></th>
<th>Category:</th>
<th>Government</th>
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<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Tokyo, Japan</td>
<td>Geographical scope:</td>
<td>Global</td>
<td></td>
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<tr>
<td>Mandate:</td>
<td>The Japan International Cooperation Agency (JICA) is advancing its activities around the pillars of a field-oriented approach, human security, and enhanced effectiveness, efficiency, and speed. JICA, in accordance with the Development Cooperation Charter, will work on human security and quality growth.</td>
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</table>
| Strategic Objectives: | 1. Commitment: Commit ourselves with pride and passion to achieving our mission and vision.  
2. Gemba: Dive into the field ("gemba") and work together with the people.  
3. Strategy: Think and act strategically with broad and long-term perspectives  
4. Co-creation: Bring together diverse wisdom and resources.  
5. Innovation: Innovate to bring about unprecedented impacts. |  |
<table>
<thead>
<tr>
<th>Name:</th>
<th>UNICEF Zambia</th>
<th>URL:</th>
<th><a href="https://www.unicef.org/zambia/">https://www.unicef.org/zambia/</a></th>
<th>Category:</th>
<th>Government</th>
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<td>Geographical scope:</td>
<td>National</td>
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<td>Secretariat:</td>
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<tr>
<td>Mandate:</td>
<td>UNICEF works to uphold the rights and well-being of all children in Zambia, across health, nutrition, HIV/AIDS, WASH (water, sanitation and hygiene), protection, social inclusion, emergencies, disabilities and adolescent development. In Zambia, UNICEF’s Country Programme aims to reach the most disadvantaged children. UNICEF works with the Government on policy to improve basic social services, as well as on the ground to make sure that these services reach all children, especially the most vulnerable.</td>
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<tr>
<td>Name:</td>
<td>Forum for Agricultural Research in Africa (FARA)</td>
<td>URL:</td>
<td><a href="https://faraafrica.org/">https://faraafrica.org/</a></td>
<td>Category:</td>
<td>Continental and regional research and innovation units</td>
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<td>Head Office/ Secretariat:</td>
<td>Accra, Ghana</td>
<td>Geographical scope:</td>
<td>Continental</td>
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<tr>
<td>Mandate:</td>
<td>Offering innovative partnerships and solutions that enhance the application of science to create sustainable and decent livelihoods in Agriculture.</td>
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<tr>
<td>Strategic Objectives:</td>
<td>• To optimize multi-stakeholder engagements and increase access to wider partnership opportunities in the development and delivery of collective actions to address shared goals. • To improve access to pristine management of STI data and information and for funding opportunities in Africa. • To strengthen the science-policy interface and impact on policy, shared visioning and collection action through evidence-based advocacy. • To strengthen individual and institutional capacities for climate-relevant agricultural transformation targeting women, youth, agribusiness and smallholder farmers. • To improved technical and fiduciary capacities of partners for outreach, coordination, programme implementation. • To build a network of critical masses of actors in Africa working in major programme areas; including climate change, bio-economy, nutrition, agribusiness and natural resources management while enhancing responsiveness to youth, women and the private sector.</td>
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<tr>
<td>Alignment with National, Regional and Continental Policy Agendas:</td>
<td>Facilitating research agenda setting for increased and effective application of science and innovation to effect climate-relevant transformation of national agricultural and food systems and to contribute to CAADP and the SDGs.</td>
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<tr>
<td>Name:</td>
<td>Islamic Development Bank</td>
<td>URL:</td>
<td><a href="https://www.isdb.org/">https://www.isdb.org/</a></td>
<td>Category:</td>
<td>Financial</td>
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<tr>
<td>Head Office/ Secretariat:</td>
<td>Jeddah, Saudi Arabia</td>
<td>Geographical scope:</td>
<td>Global</td>
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</table>
| Mandate: | | • The Islamic Development Bank is a multilateral development bank (MDB), working to improve the lives of those we serve by promoting social and economic development in Member countries and Muslim communities worldwide, delivering impact at scale.  
• We provide the infrastructure to enable people to lead better lives and achieve their full potential.  
• We believe all people have the right to live in dignity and prosperity, and that nurturing economic growth is the best route out of poverty.  
• We equip people to drive their own economic and social progress at scale, putting the infrastructure in place to enable them to fulfil their potential.  
• We build collaborative partnerships between communities and nations, across the public and private sectors. |
| Strategic Objectives: | | • Strategic objectives point to the Civil Society Engagement Policy which aims to operationalise the pillars of the Islamic Development Bank to effectively engage with civil society, connoted as “developer partners”. Emphasis on strategic and systematic engagement with civil society.  
• The Civil Society Engagement Policy aims to create a framework of dialogue, consultation and partnership with CSOs to foster the sharing of knowledge, experience and best practices. It also aims to improve direct assistance to local communities has four pillars:  
1. Mainstreaming CSOs in in-country engagements, programs and projects  
2. Engaging with CSOs as partners  
3. Building capacity  
4. Diversifying sources of financing. The Policy is guided by six non-discretionary principles of country endorsement, innovation, partnership, selectivity, solidarity and inclusiveness. |
<p>| Alignment with National, Regional and Continental Policy Agendas: | | We foster innovative and sustainable solutions to the world’s greatest development challenges, as we work towards the UN Sustainable Development Goals |</p>
<table>
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<tr>
<th>Name:</th>
<th>CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development)</th>
<th>URL:</th>
<th><a href="http://www.coraf.org/">http://www.coraf.org/</a></th>
<th>Category:</th>
<th>Regional Research and Innovation Unit</th>
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<tbody>
<tr>
<td>Head Office/ Secretariat:</td>
<td>Dakar, Senegal</td>
<td>Geographical scope:</td>
<td>Regional</td>
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**Mandate:**
The primary objective of CORAF is to improve livelihoods in West and Central Africa through sustainable increases in agricultural production and productivity, promoting competitiveness and markets.

**Strategic Objectives:**
This objective is achieved through addressing the critical issues of food and nutrition insecurity, chronic poverty, and youth unemployment within the framework of the following Core functions.

- Coordination and Capacity Strengthening;
- Scaling Technologies and Innovations;
- Creating an enabling environment at regional level for technology flows and increased trade;
- Knowledge Management and Learning.

To achieve this, CORAF seeks to deliver on the following four Results:

- Increased use of appropriate technologies and innovations in West and Central Africa;
- Informed decision-making for improved markets and scaling of technologies;
- Enhanced institutional and human capacity in agricultural research for development;
- Demand for agricultural knowledge from target clients facilitated and met.
<table>
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<tr>
<th>Name: Arab Bank for Economic Development in Africa (BADEA)</th>
<th>URL: <a href="https://www.badea.org/index.htm">https://www.badea.org/index.htm</a></th>
<th>Category: Financial</th>
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<tr>
<td>Head Office/ Secretariat: Cairo, Arab Republic of Egypt</td>
<td>Geographical scope: Regional</td>
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</table>

**Mandate:**

The Bank was created for the purpose of strengthening economic, financial and technical cooperation between the Arab and African regions and for the embodiment of Arab-African solidarity on foundations of equality and friendship. To achieve this end, the Bank was given a mandate to:

- Participate in financing economic development in African countries.
- Stimulate the contribution of Arab capital to African development.
- Help provide the technical assistance required for the development of Africa.

The focus of the mandate aims to poverty reduction and encourage economic development and growth in Africa. The focus areas of the BADEA mandate includes public investment in transport, healthcare, education, energy and agriculture.

**Strategic Objectives:**

Strategic objectives of BADEA are threefold. Firstly, to aid African nations with large balance-of-payment deficits. Secondly, to provide technical assistance and thirdly, to sponsor Arab investments in Africa through export financing and investment guarantees.
17 GAP ANALYSIS AND RECOMMENDATIONS

Based on the sections covered in this study, the following section provides recommendations to address research and capacity development opportunities in the different African regions. This were be based on the strengths and mandates of various organisations in the regions. The section is structured to provide a continental overview, from where more detailed assessments are presented within the different regions, with many regional recommendations derived from key-informant interviews conducted during this study.

17.1 Continental

17.1.1 Research output and main thematic areas

Water and Sanitation research can be grouped into three categories: Water Supply, Sanitation and Hygiene. One of the broad themes within Water Supply has been Sustainability and Functionality in terms of infrastructure, Governance, Technology and Climate Change. These broadly apply to urban settings, while rural settings across Africa are vastly heterogenous. The topic of Sanitation is also investigated mainly from a Sustainability and Technology perspective. Governance and the Policy environment are investigated in terms of Sanitation. One of the main topics under Hygiene has been the supply and technologies thereof in public facilities such as schools and markets. Another emerging topic relates to mechanics that attract investment in water infrastructure across the full value chain, such as Water Infrastructure Finance.

A general finding was that Africa and its academics and researchers based locally, do not publish enough outputs, but also to few about African challenges. The perception is that the rate of publications has declined over the past 20 years, and that the level of scientific outputs in the general water management field, is relatively low. Many outputs may be of grey literature nature, possibly due to academics being encouraged to produce policy-informing outputs. Nonetheless, this shift in focus hinders the progress of scientific thought and reasoning. Possible reasons for this low publication rate are academics leaving the continent and inadequate incentive structures. South Africa however has been singled out as one country where the financial incentives are higher than in other countries, while organisations like the WRC also stimulate significant research. In Europe for example, employers put pressure on young and emerging researchers to publish, which is generally not the case in Africa.

Research in the field of water and sanitation is effective in Africa but encounters some gaps and difficulties. One important finding was that most research projects in Africa focus on Water Supply and neglect the Sanitation side of the field. While this aspect is implicit in some research, it remains on a significantly small scale. While many organisations and funders refer to WASH, on closer inspection, they do not support or address the entire field, which often results in disjointed efforts. Other gaps and challenges include:

- Many publications sit within other related disciplines such as chemistry, while publications in the social and economic sciences are lacking.
- Research institutions, in general, lacks funding for implementation.
- The number of researchers and specialists remains relatively low.
- The topics covered are mainly technical and do not address governance.
- Most research focusses on surface water and (geo)-hydrology, while groundwater is neglected.
- Quantification, in general, is also neglected, in particular, available groundwater.
- Technologies developed in research are not suitable for all regions of Africa.
- Difficulty in transferring technologies from research results to the population.
• The obligation to take global challenges into account as part of their study (example: Climate change)

17.1.2 Mandates
Similar to the sub-regions in Africa, mandates of the significant enablers are aligned. This however often leads to duplication and overlap when organisations attempt to improve existing research. Due to limited funding, organisations are often in competition with each other, which is where collaborative networks such as AUDA-NEPAD Networks of Water Centres of Excellence (SANWATCE, WANWATCE and CEANWATCE) have been thriving. Comparing between the regions, Southern Africa has a better history and tradition of collaborating between different institutions, whereas the East African for example also collaborate, but with institutions outside Africa. In general, a lack of communication and coordination between facilitators and actors for research funding exists.

17.1.3 Policy Frameworks
In general, countries align well with regional policy frameworks. For example, several water-related policies and organisations, such as the African Development Bank’s Water Strategy 2021-2025: Towards a Water Secure Africa attempt to align with AMCOW’s 2025 Africa Water Vision. Apart from these policy documents, organisations’ visions often also align with those of continental and international bodies such as AMCOW and the UN’s SDGs.

Water Strategy 2021-2025 aims to:
• Achieve universal access to safe water
• Improved sanitation and hygiene
• Assuring and safeguarding water quality for all users

The African Union Agenda 2063’s aspiration 1 reads: A prosperous Africa, based on inclusive growth and sustainable development. Goal 7 addresses environmental sustainability and climate resilient economies and communities. Under this goal the priority areas are to implement the Water Strategy 2021-2025 and Sharm El-Sheikh Commitment on Water and Sanitation (now transited to Achievement of Sustainable Development Goal 6 on Water in Africa). Furthermore, under these priorities are Water Security; Climate Resilience and Natural Disaster Preparedness and Prevention. As part of these priorities, the first ten-year planning cycle aims to improve living standards, more specifically, that nine out of ten persons will have access to safe drinking water and sanitation; while electricity supply, internet connectivity and waste recycling in cities will be up by 50%.

Importantly, the AU also prioritises the harmonisation of policies and strategies on water resources intending to facilitate integration into development plans. But also, the promotion of Transboundary Water Management and Integrated Water Resources Management: and to strengthen existing river basin organisation. As part of its sectoral ministerial functions, it aims to support and collaborate with AMCOW with regard to plans and policies on the continent, as well as the RECs. These guiding documents also go hand in hand with the Africa Sanitation Policy Guidelines, published in June 2021 by AMCOW. Finally, AMCOW has also mandated organisations such as the African Civil Society Network for Water and Sanitation (ANEW) as the umbrella organisation of water and sanitation civil society NGOs in Africa.

However, several geo-political and historical legacies continue to challenge progress. North Africa is often associated more with Mediterranean countries than with other African countries. For this reason, these countries regularly collaborate with these countries. The French language barrier remains a significant challenge on the continent. While most African countries have excellent Water and Sanitation related policies and are instrumental in guiding certain directives, ‘on the ground’ policies are often not aligned, while implementation due to other priorities, no clear vision and governmental politicising have
been highlighted as the major challenges. Other challenges include a low level of action citizenship and misuse of government tax income. In other words, Africa possesses the relevant knowledge and policies but lacks implementation. Rwanda has been highlighted as a success story, where considering its political history, has adopted many elements of Malawi’s National Planning Commission and implemented it with significant achievements.

Furthermore, policies are often influenced by international agencies located in developed countries and based thereupon, which are not viable in developing countries. On the other hand, countries are often also guided by thematic ‘movements’ such as the WEF (water, energy and food) nexus, Green Climate Fund, Adaptation Fund. Such alignment is required, otherwise funding for research becomes more difficult. Lastly, stakeholders have indicated that indicators lack the assessment of the achievement of the programs defined by the policies.

17.1.4 Recommendations

- River basin organisations are often neglected in research and policy discussion, which needs attention. These activities usually occur within a country context, while not considering the important transboundary river basin organisations.
- The SADC region should ensure that regional and domestic funding of research in water and sanitation is increased as this will allow for a counterbalance to the foreign funding flows, as these international funding streams can be removed compared to the domestic and regional budgets of SADC and its member states.
- To address duplication, donor coordination needs to be improved. National planning commissions exist which should do this coordination.
- Climate change for resilience building should become a central theme and be mainstreamed in research and policy.
- Research often occurs in the form of pilot projects without any upscaling. Results that show good potential need to be upscaled.
  - This also speaks to a need to increase innovation and solution-orientation, after research has identified good viable ideas.
- Champions for research need to be identified, who can also serve as advocates for the field.
- Quantification of expenditure/financing on Water Supply, Sanitation and Hygiene needs attention. This will address issues of tracking and accountability.
- The private sector was also identified as a key role-player to research the most appropriate technologies for Sanitation and Hygiene.
- We need more evidence that WASH can create employment and add value.
- When governments engage with development partners, they need to assert their respective research agendas, and not be dictated by external funders.
- To ensure that the continent is also able to effectively manage its research and information resources, it is recommended for the creation of a database that consists research and knowledge information to support research management on the continent, with each region responsible for their contributions. This allows for continental and regional coordination of research agendas and information that can be used when engaging with external partners, setting future plans, and coordinating the development of local science systems through effective marshalling of resources in the water and sanitation sector. This same approach can be applied in other research fields.
17.2 Southern Africa

17.2.1 Research output and main thematic areas

In line with the opinions of stakeholders representing the continent, Southern African does not produce enough research outputs. South Africa still produces, by far, the most water and sanitation research in the region (~80%) (in line with findings of Elema, 2019). This highlights the role of the WRC and SA-NRF, however, most of the research is focused on South Africa – this is due to their mandates.

Most of the research focuses on various thematic areas, as they are listed by Web of Science, which includes Multidisciplinary Geosciences, Meteorology Atmospheric Services; Environmental Sciences and Engineering (specifically Civil and Environmental). There are also some variations amongst specific countries that also have other research fields in the top 5, such as Ecology, Marine Freshwater Biology, Oceanography, Soil Science and Agronomy.

In terms of disjointed government departments, in Malawi for example, Water Affairs is situated in one department, while Sanitation is in another. Furthermore, most research focuses on surface water and (geo) - hydrology, while groundwater is to some extent neglected. In other words, whenever a new settlement emerges or an existing one expands, the default to direct research and funding toward surface water and hydrology, rather than groundwater. Groundwater will become increasingly important for cities that are expanding into megacities, such as Dar es Salaam, Dodoma in Tanzania and Windhoek in Namibia.

Quantification of Water Resources for WASH has also been identified as still lacking. In Cape Town for example, it would be useful to know how much groundwater is available. Most research uses the classical hydrological and geological construction of numerical and chemical models, while the link or translation to the water supply of WASH activities is lacking.

In terms of funding for research and capacity development, there is also wide variation between different countries in terms of the mix of domestic and foreign funding and local and foreign institutions. Even though South Africa is the largest research producer in the Southern African region through the Water Research Commission and the National Research Foundation, it is not necessarily the largest research partner for other Southern African countries in terms of collaboration, with South African researchers mainly collaborating with other South African researchers, and then with researchers in neighbouring countries Eswatini, Lesotho, Namibia with some in Zimbabwe. Botswana and Mozambique on the other hand look different. Botswana mainly produces amongst its institutions and other regional partners in Southern Africa, while Mozambique produces within its local universities but has strong linkages with European partners in this research environment.

Most stakeholders have indicated the need for national governments to increase their funding and commitment towards WASH, while shifting their associated priorities, to ultimately decrease their dependency on foreign funding. Political commitment and prioritisation towards WASH have also been highlighted. The Department of Science and Innovation (DSI) in South African has been identified as a good example of a well situated and mandated government-related institution to further Water and Sanitation research given their broader role is supporting research in general in South Africa. Moreover, the South African WRC is also regarded as an exemplary model for supporting water and sanitation research, predominantly deriving their funding from bulk water users in South Africa though the Department Water and Sanitation.
17.2.2 Mandates, Policy Frameworks and Strategies

SADC is seen as an exemplary region on the continent. In terms of the SADC regional WASH Policy landscape, SADC Water, based in Gaborone, Botswana, play a major role in coordinating regional cooperation in the sector, with various frameworks and strategies at a regional level which include SADC Water Policies and frameworks such as the Regional Strategic Action Plans (RSAP) for the Water Sector (see: https://www.sadc.int/themes/natural-resources/water/). These plans focus on the development of regional water resources that allow for countries to be able to provide food security and curb water shortages through regional partnerships such as sharing water resources. This is done through shared management of river basins and watercourses, such as the Permanent Okavango River Basin Water Commission (OKACOM), The Orange-Senqu River Commission (ORASECOM) and the Zambezi Watercourse Commission (ZAMCOM). Southern African policies align the various organisations to the regional agenda. These instruments feed into the regional strategic action plan for Water and Sanitation which is reviewed every five years. Regional policies are therefore also aligned to the national policies. While institutional arrangements are well in place, there is always room for improved operationalisation, as organisations are often dictated by their funders’ agendas and subject interests. Similar to the other regions in Africa, this often leads to duplication.

17.2.3 Most significant enablers of Water and Sanitation – related activities

In recent years, related ministries such as energy were co-convened at SADC ministerial meetings with senior officials participating in the Water Resource Technical Committee (WRTC). The WRTC and ministerial meetings are convened by SADC Water. In South Africa itself, and within the wider region, three large funders of water and sanitation research are that of the South African National Research Foundation (NRF), the Council for Scientific and Industrial Research (CSIR) and the Water Research Commission (WRC). These three bodies are responsible for multiple focus areas that range from ecological management to water related industrial uses and engineering. This is especially important with South Africa’s population and large economy vulnerable to water shocks, as it is a water stressed country. This had made it even more important for good regional cooperation between South Africa and its neighbours such as Lesotho in terms of water resource management.

Important regional and continental players in Southern Africa are that of WaterNet, and AUDA-NEPAD SANWATCE. These two networks have been established to build regional and institutional human capacity within the region as networks between universities and other research and training institutions. Along with SADC Groundwater Management Institute (SADC-GMI) and Cap-Net, these networks expand research and human capacity base in the region to solve water and sanitation related challenges. Global Water Partnership further provides significant contributions to convene decision makers at a political level, along with development partners in the region to coordinate activities in the regional WASH sector.

International examples of key enablers to the region that came through in the funding of research that was published on the Web of Science are that of the UKRI, European Commission and the CGIAR in Europe. All three of these institutions are key enablers with numerous partners in the region, with the UKRI a recent amalgamation of the various funding agencies that existed in the UK. USAid is a key partner from the US that came up in terms of supporting research that led to publications.

Another important aspect to note is the important partners that have historical ties to their respective countries, such as the Democratic Republic of Congo with Belgium and Mozambique with Portugal. Beyond the more formalised funding institutions in science and technology, there are also numerous examples of financial institutions, such as the African Development Bank, and philanthropic or environmental organisations such as the Bill and Melinda Gates Foundation and Blue Ventures.
Another significant role-player in the SADC region includes Rural Water Supply Network (RWSN), which is a global network for rural water supply professionals that has a presence in Southern Africa. Bodies such as these are important for increased human capacity development as this allows professionals in the region to connect to a wider global body of water industry professionals for training and knowledge exchange. Cap-Net as part of the UNDP is also increasingly important as it is the wider institutional body that makes up the region’s previously mentioned WaterNet programme. WaterNet is another initiative that is linked to the professional development of professionals in the region for the water sector.

In addition, the Japan International Cooperation Agency (JICA) is responsible for facilitating Japan’s cooperation with many countries across the world, including in science and technology. This has resulted in important partnerships in water and sanitation in the Southern African region whereby international cooperation facilitates development in this sector. This is due to the focus of JICA on Overseas Development Assistance (ODA) which enables the Southern African region to access resources and expertise that can support the regional water and sanitation sector. The second organisation is the United Nations Children Fund (UNICEF). UNICEF in this domain is mainly focused on providing water and sanitation to the region’s youth through the wider United Nations system.

Other continental bodies that are significant role players within the Southern African region are the Africa Water Association (AfWA) and the Forum for Agricultural Research in Africa (FARA). AfWA is an association primarily concerned with ensuring access to drinking water with membership including various water utilities on the continent. FARA on the other hand is an important role player in promoting research and development in the agricultural space, with water being a key resource necessary to develop and promote agriculture for the sustenance and nutrition of the region.

These mentioned entities work extensively at a policy level for the region and the continent, as there is a continental level of coordination among different facets of water related research and management, such as around the use of large-scale water resources and agricultural production. The ANBO is an especially important role-player in the region as multiple water systems run across multiple countries. ANBO is an important forum for engagement on how to develop and share the resources along the river basin region.

17.2.4 Recommendations

In this section, opportunities and synergies between organisations, networks and role-players in the sector will be discussed with recommendations made to enhance research and collaboration in the region.

- The creation of a research management and information system for the region that can be accessible to researchers, policymakers and other parties that can allow for better access for information and management of the water and sanitation research sector in the region. This will also allow for better alignment and coordination locally, regionally and continentally. This should be done either at a regional or continental level to ensure that there is a more central access point.
- Increase research into Sanitation, Groundwater and the quantification of groundwater availability.
- Increase research into aquifer recharge as a potential significant contributor to water security and WASH activities in the region.
- Investigate entire systems and see how complimentary resources can be utilised e.g. when is surface water expected to be low; how much groundwater is available.
- Groundwater tends to be the back-up if surface water fails. Efforts should be made to change this perception or mindset.
- Research into groundwater for megacities.
• Researchers need to acknowledge the need for conjunctive surface and groundwater use.
• Closer collaboration with river basin organisations is necessary. Research and policy discussion often occur in a national context and not in the context of the river basins’ boundaries.
• To address duplication, donor coordination needs to be improved. In-country ministries also exist which should do this coordination e.g., in South Africa, Foreign Affairs. Others, national planning commissions.
• Improved collaboration with SADC regional governments to promote domestic funding in the water and research sector to also counterbalance external funding, as this will ensure a more stable science system.

There is a need for an increase in national funding for water research in the Southern African region and specifically in other SADC countries beyond South Africa, where most research funding is dependent on funding from the global north and where the challenge then becomes that the research priorities of donors start to dictate the priorities. Funding is however challenging, given other priorities in the region and a general fiscal constraint. Moreover, institutions need to be strengthened to be able to manage and support the larger research systems in countries.

When one further considers institutions with formal ministerial mandates, as in the case of the South African Water Research Commission (WRC), WaterNet, AUDA-NEPAD SANWATCE, GWP-SA, SADC-Groundwater Management Institute (SADC-GMI), it is clear that these institutions have either a national mandate (WRC), SADC Regional mandate (WaterNet, AUDA-NEPAD SANWATCE, GWP-SA, SADC-GMI) and/or a continental mandate (AUDA-NEPAD SANWATCE). In the case of WaterNet and AUDA-NEPAD SANWATCE, both are networks of universities and research Institutions in the region, with memberships overlapping. However, AUDA-NEPAD SANWATCE is clearly mandated to focus on Research and related capacity development with WaterNet focussing on Capacity Development. This is not to say that activities should and could not overlap in certain cases, and for this reason a MoU exists between the two organisations.

The SADC Water Science Research Agenda (approved by the SADC minister of Water in 2015), do provide a framework for research priorities in the region, however there is a need to review this Agenda specifically after the Covid-19 pandemic and the continuing awareness around the climate change challenges facing the region in future. Both AUDA-NEPAD SANWATCE and WaterNet are considered to be the ‘custodian’ of the SADC Research agenda by SADC Water.

Considering the above, there are ample institutions to support the full water cycle in terms of research and capacity development in the SADC water sector. Opportunities lie in strengthening human and institutional capacity in the region, with funding for research a major challenge.
17.3 Eastern Africa

17.3.1 Research output and main thematic areas

Research output (publications) in the Eastern African region related to water and sanitation is dominated by Egypt, followed by Ethiopia and Kenya. There is a high research output from the Eastern region based on current findings over the last decade in water and sanitation.

Web of Science bibliometric output shows a variety of dominating thematic areas under water resources where the most focus placed on the top 5 which are Environmental Science Ecology, Engineering, Geology, Agriculture and Meteorology Atmospheric Sciences. Some of the publications are from the Marine Freshwater Biology, Public Environmental Occupational Health and Science. Thematic focus areas increase in diversity as research output increases per country, which additionally includes but not limit to Oceanography, Microbiology, Toxicology and Computer Science. Although diverse research focus is beneficial to the region's development, it does however raise a concern on the areas that are possibly neglected in terms of research, such as sanitation-based publications as it does not come across in the web of science research output. Additionally, taking into account the water sources in the country and enablers supporting research work, possibly plays a role in which research focus areas are invested in depending on strategic alignment with institutions and funding agencies.

17.3.2 Mandates, Policy Frameworks and Strategies

The East Africa WaterAid Regional strategy’s vision is for “a region that is well-governed, sustainable and contributing to everyone, everywhere having clean water, sanitation and hygiene by 2030”. WaterAid is said to be the only organization focusing exclusively on water, sanitation and hygiene in the Eastern region. The strategy aims to bank on the experience and learnings from country programs to bring about change in policy and practice at the regional level. The region’s agenda strategically aligns with the United Nation’s Sustainable Development Goal 6 for which member states exhibit a commitment to SDG 6 through their respective National Development Plans. In the strategy, East Africa aims to improve collaboration with organizations to address the needs and concerns identified, such as actualizing major policy across the countries, while further supporting, strengthening and empowering WASH networks in the region such as KEWASNET (Kenya Water and Sanitation Civil Society Network), TAWASNET (Tanzania Water and Sanitation Network), UWASNET (Uganda Water and Sanitation Network). Additionally, strategic partnerships to work within the region, together with WaterAid, includes East Africa Community (EAC), AMCOW, AfDB, Africa Population Health Council, Africa Women Development and Communication Network (FEMNET), World Agroforestry Centre (ICRAF), Governments of East Africa Community member states, development partners and the private sector are all considered key stakeholders to join forces to deliver on the regional strategy. Even though most of the countries have adopted and recognized the need to strengthen and improve investment in WASH, due to poor governance, power struggles, inequities and fragility, progress in the region has slowed down (WaterAid East Africa Regional Strategy 2019/20-2022/23). The East African region’s focus strategic alignment is also influenced by the Africa Water Vision 2025 and the African Union’s Agenda 2063.

Furthermore, Eastern Africa is a partner of the Global Water Partnership (GWP) network, with strategy promoting the Integrated Water Resources Management (IWRM) and ideology to adopting a holistic approach to finding solutions to water insecurity in the region. The strategy is also influenced by the IWRM policy developed the Bank Groups (including AfDB) Developed plans and strategies in alignment with IWRM also focus on Climate Adaptation seeking to address climate change through the Regional Consulting Partners represented by the Country Water Partnerships. Further alignment with international organizations are enforced or agreed upon between countries through Memorandums of Understanding, commitment to the United Nations Sustainable Development Goals tends to be quite
common in research agendas, partnerships and collaborations between the international organizations and the eastern region.

In relation to transboundary surface and groundwater resources, which have led to conflicts in the region, the African Network of Basins Organizations (ANBO), aims to strengthen coordination and collaboration capacity of African Lake and River Basin Organizations and Groundwater Commissions through the support of the AMCOW across the continent with implementation of the NABO Strategy and Action Plan of 2014. Additionally, UNESCO-IHP intends to develop international water law trainings for the region’s representatives with the intention of improving transboundary water cooperation between countries.

17.3.3 Most significant enablers of Water and Sanitation – related activities

Based on the research output on Web of Sciences, research support and funding in the region is supported both internationally and regionally. International funding from European countries and some Eastern countries are enabled and offered through well-established organisations with international strategies to invest in the eastern regional research and development namely the European Commission (through European Union), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), United States Agency for International Development (USAID), Deutscher Akademischer Austausch Dienst (DAAD) scholarship programs, Bill and Melinda Gates Foundation, National Natural Science Foundation of China, Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT), the United Kingdom Research and Innovation (UKRI) through the Natural Environmental Research Council (NERC), United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Consultative Group on International Agricultural Research (CGIAR) are some of the most dominant funding agencies. However, there is a high number of funding support from regional and local enablers, especially from Egyptian institutes. The Egyptian Science and Technology Development Fund and the Egyptian Ministry of Higher Education Scientific Research are among the most dominated funding agencies. Some of the less significant, however quite relevant funding agencies in the region include the Water Research Commission (WRC), Water Resources Research Institutes, Centre for Water Resources, and the African Development Bank.

Significant enablers contribute to the Eastern region through various roles with mandates and agendas by enable funding initiatives and research, capacity building (education), government (policy-making), and some philanthropic work. WaterAid is one of the most dominating enablers in the eastern region, which plays a supporting and influential role in the region through economic growth by improving access to clean water and decent toilets, while encouraging collaboration and integration of WASH across all sectors affecting development in the region. With regional offices in Ethiopia, Tanzania, Rwanda and Uganda, WaterAid is able to support Country Programmes through producing knowledge that addresses WASH gaps and advocate for service delivery, capacity building through research, learning, influence and facilitate knowledge-sharing forums. Additionally, significant networks such as the AUDA-NEPAD Centres of Excellence are significant enablers across the continent, the Central and East African region’s Water Network (AUDA-NEPAD CEANWATCE) centres are based in institutions in Sudan, Ethiopia, Uganda and Kenya.

UNESCO is a significant enabler in the region through various initiatives and programmes aimed at capacity building in the region through the Intergovernmental Hydrological Programme addressing research and training activities and assist member states in thematic areas related to water research. UNESCO’s water-related networks serve relevant thematic and geographic priorities through regional centres such as the Centre for Training and Water Studies in Egypt, Centre on Groundwater Resources Education, Training and Research based in Nairobi Water Institute and the Centre on Capacity
Development and Research in Water Harvesting based in the Khartoum National Training of the Public Water Cooperation in Sudan. To improve collaboration and connecting stakeholders, UNESCO enables open access to various types of science-based information and participatory platform through its Water Information Network System. And finally, enhancing its contribution through the water-related UNESCO chairs based in Ethiopia and Sudan and finally, water-related office networks in Nairobi (Kenya) and Cairo (Egypt). UNESCO’s contribution to the region encourages capacity development and integration of the UN sustainable development goals through strategic contributions in the activities and initiatives through its water-related programs. UNESCO’s contribution places most focus on water supply and not much on sanitation. Additionally, through the UNESCO-IHP transboundary surface and groundwater management resources.

International enablers play a significant role through funding research in the region through institutional collaborations on research work, or scholarships received. Significant enablers from the European continent contribute significantly through funding of research projects in the region such as the Swedish International Development Agency (SIDA) support organizations that contribute to poverty reduction, and through its bilateral strategies, contributes selectively to Ethiopia, Somalia, South Sudan, Sudan, Tanzania and Uganda in the region. Through collaborations with UNICEF, SIDA provide running water to health clinics in Uganda and many other countries and in cooperation with the Water Sector Trust Fund, supports bettering rural toilets in Kenya. Enablers such as USAID serve a similar support role to the region through collaboration with regional government organizations, such as the East African Community, the Common Market for Easter and Southern Africa (COMESA) and the Intergovernmental Authority on Development (IGAD). Similarly, the Federal Ministry of Education Research (BMBF) in Germany, supports the region through promotion of international exchanges of trainees, students and researchers and supporting them through funding and research grants or programs (Alexander von Humboldt Foundation, German Academic Exchange Service (DAAD) through various Pan-African University Institutes. The United Kingdom Research and Innovation (UKRI) is also a significant European enabler in funding research in the region through its various councils, with the Natural Environment Research Council (NERC) appearing quite frequently in research funding.

The European Commission through the European Union is an indicator of the various European-based enablers in the region, contributing significantly to Africa, which is an alignment with its strategy to strengthening strategic alliance through European Union-African Union partnership (including supporting water resources and sanitation). In addition to Africa-EU cooperation, is the AfriAlliance project which aims to better prepare Africa for future climate change challenges and working with African and European stakeholders in the areas of water innovation, research, policy and capacity development. Europe’s contribution to African Development reflects in the Cooperation in International Waters in Africa (CIWA) representing partnership between the World Bank, African partners and governments of Denmark, European Commission, Norway, Sweden, Netherlands and the United Kingdom.

The Eastern Region also benefits from the initiatives and works of the African Networks of Basin Organizations (ANBO) through projects such as the Nubian Sandstone Aquifer System (NSAS) shared by Chad, Egypt, Libya and Sudan, Strategic Partnership for Mediterranean Sea Large Marine Ecosystem (MedPartnership) executed by UNESCO-IHP on Management of Coastal Aquifers and Groundwater and the FE2W initiative. International organizations such as ICPAC-IGAD are significant enablers and supporters of the trans-boundary water resources such as Nile and Shebelle River, Victoria, Tanganyika and Turkana lakes in the region.

Even though the SNV (Strichting Nederlandse Vrijwilligers) non-for-profit Organization did not come up in the bibliometric study, through one of the interviews with WASH sector representative, and mentioned SNV as one of the major enablers in the Eastern African region. However, SNV’s reach is continental and regional, including Africa, Asia and Latin America. SNV aims to bridge the gaps between theory
and practice, policy ambitions and implementation at scale. SNV’s focus is on agriculture, energy and WASH and specifically on WASH interventions, SNV projects aim to help people gain access to, and use of sanitations, and gain access to basic drinking water supply services. The impact of Covid-19 pandemic showed an increase in demand in WASH services especially handwashing and healthcare services. Driven by their contribution to SDG 6, WASH-related programmes by SNV had to redirect some of its funding towards Covid-19-related efforts, which essentially serves the hygiene aspect of WASH through programmes such as the Sustainable Rural Sanitation and Hygiene for All at scale (Kenya, Mozambique, Rwanda, and Uganda). Area-wide Rural Water Supply Services programme which is integrated with IWRM, Urban and Sanitation (Ethiopia, Kenya and Mozambique) focusing on low-income areas and re-use of faecal sludge. Additionally, through the Initiative for Sanitation Workers, SNV collaborating with international organisations (WaterAid, World Bank, World Health Organisation, International Labour Organization (ILO), UNICEF and USAID in supporting WASH-related activities in all regions of target.

17.3.4 Recommendations

Various institutions in the Eastern African region conduct research, with some institutions, predominantly from the Global North, supporting WASH research. As in the case of other regions,

- there is a need for greater funding from member states for WASH research and human capacity development.
- Projects are often supported on a per-project basis with better coordination required to ensure less duplication and where required addressing regional priorities.

Moreover, to ensure better access to information and data on research and knowledge production in the region,

- it is recommended to establish a database of research and knowledge production in the water and sanitation sector to ensure that the region is better able to coordinate efforts and better marshalling of external resources, but to also provide support for the proposed increase in domestic funding.

This domestic funding is important to ensure the health of the science systems of the region and its member states. This will also prevent duplication across both the local states and the wider region, and will promote information sharing across the region that relies on shared water resources.

It is identified that the weak state of institutions and capacity are two major constrains and the long history of distrust among the countries resulting in limiting operations for sustainable governance of water resources and climate-change related risks in the region.

- The recent synthesis of water security in the region identified that the there is a need to strengthen investments in enhancing water security in the region.

At the regional level, which excludes Eritrea and Somalia, IGAD countries have a Regional Water Resources Policy in place which seeks to harmonize and consolidate existing water policies, helping to address the existing gaps. Although, inadequate policy and regulatory frameworks continue to constrain service delivery. Countries such as Eritrea, Ethiopia, Somalia, South Sudan, Sudan and Uganda lack independent regulatory agencies for water services (Olet, Guene, Kayondo & Chanda, 2020). The region has been struggling with drought for quite some time, based on the AfDB report on the region’s water availability,

- it is encouraged that more support and investment is made towards building infrastructure for groundwater systems, research and capacity building in understanding sustainable methods to use groundwater through the AfDB’s initiatives and programs.
17.4 Central Africa

17.4.1 Research output and main thematic areas

Central Africa’s contribution to water and sanitation research output is among the lowest in Africa compared to other regions. Research outputs from the Republic of Chad, Republic of Cameroon and the Congo Republic contribute the most to the region’s research outputs.

Thematic areas underwater resources based on Web of Sciences output include Environmental Sciences Ecology, Engineering, Geology, Marine Freshwater Biology and Meteorology Atmospheric Sciences. Agriculture, Public Environmental Occupation Health and Microbiology. Countries producing more research have a much higher diversity in thematic areas including Oceanography, Government Law, Computer Sciences, and Biodiversity Conservation to name a few.

17.4.2 Mandates, Policy Frameworks and Strategies

The Central African regional strategy is shaped by the continental agenda through the African Development Bank’s (AfDB) intentions to strive for inclusive and green growth and making an impact where needs are the greatest through initiatives such as the support for Rural Water and Sanitation Initiative (RWSSI). The RWSSI puts strong emphasis on linking rural water and sanitation projects with knowledge building and empowering of women and youth initiatives led by African Governments. The Kigali Action Plan was drawn up and supported by the African Minister’s Council on Water (AMCOW), the African Union, and the AfDB to support some of the “most off-track” countries in the most practical way possible. The Kigali-Plan targets the construction water supply facilities and basic sanitation facilities in ten countries over a period of 5 years, which is supported through strategic national plans in the respective countries.

Central Africa region is a partner of the Global Water Partnership (GWP) network and aims to support sustainable development through the promotion and implementation of Integrated Water Management in the region. In support of appropriate long-term governance of water resources to ensure sustainable use and improved regional cooperation, with the support of the GWP, the Economic Community of Central African States (ECCAS) adopted a regional water policy that promotes integrated management of land, water and related resources which was approved by member states in 2009.

17.4.3 Most significant enablers of Water and Sanitation – related activities

Funding is predominantly foreign with agencies from Europe, Asia, mostly Japan, and the African Development Bank and a mix of other French, German, Netherlands, Canadian, and American-based institutions. The publications show high support in funding from the international organizations in the region from the European Commission, USAID, Bill and Melinda Gates Foundation, the German Society for International Cooperation, UKRI through the Natural Environmental Research Council (NERC), UNESCO and CGIAR are amongst the dominating funding agencies to research in water and sanitation. Additionally, some international funding from the Eastern Continent such as the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan, Japan International Cooperation Agency (JICA), National Natural Sciences Foundation of China (NSFC) and the Chinese Academy of Sciences support and fund a significant number of the research in Central Africa. Identified local funding supporting research related to water and sanitation include the African Development Bank, institutes such as Lake Tanganyika Authority, Nile River Basin Initiative and national governments, such as the Government of Burundi. Furthermore, through collaborations with tertiary institutions, some research is funded by the institution, such as the University of Burundi and University of Cameroon are some examples of local enablers.
Central African, together with the Eastern region forms part of the AUDA-NEPAD Central/East African Network of Centres of Excellence based in four countries in mostly the Eastern region (Sudan, Ethiopia, Uganda and Kenya).

Additional research from organizations’ such as IRC and Water for Good works exclusively in Central African Republic, identified influential actors [enablers] in the WASH sector in the region, some echoing some of the findings of the study where UNICEF, World Bank, European Union (Commission) and the African Development Bank identified as financial enablers and technical partners, while non-governmental organizations; Water for Good, World Vision, and Oxfam are some of the active organisations working towards improving access to water and sanitation service in Central Africa specifically. Some of the main national and local enablers in the country were identified as the Ministry of Energy and Hydraulic Resources, Directorate General of Water Resources, National Agency for Water and Sanitation in Rural Areas and the Corporation for Water Distribution in the Central African Republic. (Ref- Hilaire Dongobada, Technical Advisor for IRC & Water for Good). Although this organisation is country-specific, it’s rather significan in Central Africa.

The Global Water Programme-Central Africa is one of the significant enablers (and stakeholder of the IWRM) in the region, and supports ECCAS, the International Commission of the Congo-Oubangui-Sangha Basin and Lake Chad Basin Commission in water resource management and development activities and collaborate with the African Development Bank, UNESCO and UNECE to work towards achieving sustainable development goal 6. One of the regional networks (Country Water Partnerships) was initiated by the GWP with the aim of strengthening partnerships between the Central African countries. (Source: Global Water Partnership-Central Africa).

In addition to WASH initiatives, the African Network of Basin Organisations aims to strengthen coordination and collaboration capacity of African Lake and River Basin Organizations, Groundwater Commissions through the support of the AMCOW across the continent. The Nubian Sandstone Aquifer System (NSAS), Lake Chad Basin Aquifer, Karoo-Carbonate and the Cuvette aquifer are some of the major transboundary aquifers situated in Central Africa. Therefore these aquifers need to be managed sustainably, therefore the International Groundwater Resources Assessment Centre (IGRAC) recognized the region as one of its focal areas, through which joint effort with projects from the World Bank, an Integration of Groundwater Management into Transboundary Basin Organisations in Africa course was developed in response to needs expressed by some of the African Basin Organisations. IGRAC is one of the international support enabled through UNESCO Global Groundwater Centre, and works with other enabling organisations (World Meteorological Organization (WMO), International Association of Hydrogeologists (IAH)) and financially supported by IHE Delft Institute for Water Education, funded by the Netherlands government.

17.4.4 Recommendations

To ensure better access to information and data on research and knowledge production in the region,

- it is recommended to establish a database of research and knowledge production in the water and sanitation sector to ensure that the region is better able to coordinate efforts and better marshalling of international-outside-Africa resources, but to also bring in continental, regional and local funding streams.

This domestic funding is important to ensure the health of the science systems of the region and its member states. This will also prevent duplication across both the local states but also the wider region, and will promote information sharing across the region that relies on shared water resources.
As this region has less water and sanitation related research than other areas, with the African Development Bank as the only major continental player in the region,

- it is recommended to use the research and information database system to coordinate support from other regions, such as Southern and Eastern Africa, through the AUDA-NEPAD CEANWATCE and SANWATCE networks, to promote human capital development in the region to better support research in the field.
- Although frameworks and policies exist for the region and other enablers supporting WASH initiatives, more effort should be made to implement and monitor ambitions in local and regional policies.

It is especially important in the context of providing better local support for the Lake Tanganyika Authority and the Nile River Basin Initiative, as these River Basin Organisations are important channels for water stewardship. Recent challenges across the continent, especially in relation to the Nile River system, is testament to the need for more capacity development and better coordination with policymakers. To do this effectively, however, will require the previously mentioned database system with championing from regional and continental bodies.
17.5 Western Africa

17.5.1 Research output and main thematic areas

There is a high number of water-related publications in Western Africa, with collaborations from both continentally and internationally. Nigeria has the most water-related research publications, followed by Ghana and Burkino Faso. Liberia and Guinea have the least amount of water-related research publications. However, there was only one country, Guinea-Bissau where there were no water-research publications found under Web of Science. Nigeria has extensive collaborative enabler networks that extend to Japan, Germany and China. There is also a dependency on French enabler institutions to support water and sanitation-related research in West African countries such as Sierra Leone, Senegal and Togo.

The bibliometric analysis shows that the top thematic fields include Environmental Science Ecology, Geology, Engineering and Agriculture. There are also some variations amongst specific countries that also have other research fields in the top 4, such as Marine Freshwater Biology, Meteorology Atmospheric Sciences, Water Resources and Public Environmental Occupational Health. In terms of Water and Sanitation research, key stakeholder interviews have indicated the focus areas in West Africa: Water and Sanitation Supply Services, Flood Management, Groundwater Exploration, Food Security, Sanitation and Water Management, Domestic Waste, Water Treatment, Groundwater Technologies and challenges in the water system. Challenges include an overemphasis on research, but also a reluctance to share research results among fellow researchers. While many institutions produce research outputs, collaboration remains limited, along with no central platform where such outputs can be accessed. In line with continental and Southern African challenges, implementing agencies are often subjected to funders’ agendas and research priorities. External enablers often have alternate agendas which influence the outputs of beneficiary organisations, even though they do not align with their agenda and vision.

17.5.2 Most significant enablers of Water and Sanitation – related activities

Similar to other regions in Africa, funding in West African is predominantly foreign. The most pronounced enablers include Bill and Melinda Gates Foundation, Consultative Group on International Agricultural Research (CGIAR), European Commission, USAID, World Bank and SIDA. Noteworthy, the following financial enablers were added by key stakeholders: African Development Bank, Islamic Development Bank and French Development Agency. A global network for rural water supply professionals, the Rural Water Supply Network (RWSN) was also added, and finally, the International Water Management Institute Africa (IWMI).

Continental additions include Africa Water Association (AIWA), African Ministers' Council on Water (AMCOW), Africa River Basin Organisations (ANBO), Forum for Agricultural Research in Africa (FARA), while these regional enablers were considered significant: CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development), OMVS - Senegal River Basin Development Organization and Arab Bank for Economic Development in Africa (BADEA).

17.5.3 Mandates

In terms of mandates of the most significant enablers in West Africa, misalignment is common, no unified framework exists, interventions are isolated, while duplication also takes place, which makes internal and external collaboration difficult. The roles and responsibilities of stakeholders/actors are quite well defined in West Africa, while the principal challenge remains capacity (high level, technical and artisanal) and adequate resources in the face of population growth. Like one stakeholder said, “they see themselves as having the same role, while they do not share secrets.” It was also indicated that these organisations compete with each other.
The lasting legacies of the French occupation in West Africa have also been confirmed during stakeholder interviews, which continues to provide challenges. Language remains a significant barrier for West African countries, to be able to effectively communicate with the rest of Africa. Furthermore, Anglophone countries are significantly more independent than Francophone countries. Even though West African countries are more dependent, beneficiaries are not overly dictated by the mandates and missions of French enabling agencies. Lastly, the multiple levels of government were also raised as a challenge. It is unclear what each level’s mandate is, which often leads to overlapping.

17.5.4 Policy Frameworks and Strategies

Generally, national Water and Sanitation-related policies derive from regional frameworks and strategies such as ECOWAS (Economic Community of West African States). National policies, top-down, are in other words not misaligned with higher level frameworks. However, similar to Southern Africa, proper implementation, political will and operationalisation of these policies are not adequate. In other words, many laws are passed without an implementation and M&E decree. Furthermore, in terms of politics, governments often neglect policies and “do whatever they have to, in their manifesto, to stay in office and extend their term.” A decline in proper service delivery and governance are often the result, in the form of aged unsustainable infrastructure, power cuts, water leakages, the unwillingness of the public to pay, dependence on imported parts (subjected to exchange rate), inadequate succession plans which affect continuity, upscaling, ineffective sustainable financing mechanisms for the water and water sector sanitation, and a lack of formal networks of water and sanitation actors in the region.

On a public level, people often see water as a social service and not an economic good, which challenges governments to recover costs from the public. There are therefore fewer funds available for service delivery and expansion to areas with desperate need.

17.5.5 Recommendations

- Encourage researchers to share and disseminate results, preferably on a central platform where researchers and policymakers can access such outputs. This research and knowledge information platform will support the coordination and marshalling of resources from all sources both internal and external. There will also need to be support in this context in terms of language and translation to ensure that the West African region would have access to other databases and the rest of the continent would have access to the West African region’s work.
- As seen in South Africa, some governments in Western Africa need to assert their respective research agendas, mandates and initiatives in alignment with global enablers. This requires robust collaboration at a national, regional, and global level. More importantly, the local level must be fully integrated with not only engaging with these enablers, but also aid in aligning national framework and policies with continental and global frameworks.
- Regarding these water and sanitation related policies and framework, the local level is missing, and this is a gap in aligning local or national policies with thereof continental and global. Additionally, implementing monitoring and evaluation instruments are not efficient. This hereby offers an important recommendation for monitoring and evaluation competencies, and to encourage it particularly at the local level.
- Language is a significant barrier between Francophone and Anglophone countries because of colonial history between French and English settlers, and this hinders the development and regional engagement for water and sanitation related research. Language barriers across the African continent (considering French, English, Portuguese, Arabic, as well as African dialects) need further elaboration and interrogation outside of this research, but the importance here is the negative impact on water access, sustainable development, social development, economic growth, infrastructural investment, and service delivery. More importantly, this is also an
obstacle for capacity- and nation-building, as well as regional participation and economic prosperity.
17.6 Northern Africa

17.6.1 Research output and main thematic areas

The bibliometric analysis derived from the Web of Science shows that the key thematic areas of water- and sanitation-related research are: Environmental Sciences, Ecology, Engineering, Geology, Water Resources and Agriculture. There are also some variations amongst specific countries that also have other research fields in the top 5, such as Ecology, Marine Freshwater Biology, Oceanography, Soil Science and Agronomy.

17.6.2 Most significant enablers of Water and Sanitation – related activities

There is a good number of water-related publications in Northern Africa, as well as good collaborations with European, African and Asian institutions that contribute to the mix of domestic, continental and global funding enablers. On the regional level, funding enablers consider Libya, Morocco, Tunisia and Algeria. On the international level, funding enablers extend to Portugal, the United States of America, China, Australia and Malaysia. The main funding enablers are mostly international such as the French National Research Agency in Tunisia, Algeria and Morocco, as well as the European Commission in Morocco and Tunisia. Libya is the only country in the region that is strongly supported by the national level, with governmental institutions and universities being enablers. There is also a strong influence of French enabler institutions such as the Centre National d’Études Spatiales and the Centre National de la Recherche Scientifique in Tunisia and the French National Research Agency in Algeria. Other prominent and foreign enablers consider the Swedish International Development Agency (SIDA), Consultative Group on International Agricultural Research (CGIAR), and the African Ministers’ Council on Water (AMCOW). The water-related publications in Egypt show that there are good collaborations both domestically and internationally. Alternatively, Tunisia and Morocco focus more on international collaboration and less on domestic outputs. Tunisia and Morocco also have the most research outputs. Sahrawi Arab Democratic Republic and the Islamic Republic of Mauritania are the only two countries in the Web of Science that has no research publications on water and sanitation-related fields.

There is a strong regional focus among Algeria, Tunisia, and Morocco. Here, local universities in Algeria are noted as local enablers such as the University Science Technology Houari Boumediene; the Université Badji Mokhtar Annaba, and Université Abou Bekr Belkaid. In Morocco, local universities noted as local enablers, are the Cadi Ayyad University of Marrakech and the University of Akli Mohand Ouladj Bouira Algerie. Three Pan African Universities are prominent enablers in Algeria, which is a notable national contributor towards water and sanitation-related research. These enablers are Pan African University Institute of Water and Energy Science (PAUWES), Abou Bakr Belkaid University of Tlemcen, and the Entrepreneurship Hub of Pan African University at Uni Tlemcen.

17.6.3 Mandates, Policy Frameworks and Strategies

Many stakeholders indicated that North Africa associates more with Europe and other Mediterranean countries than with African. These countries therefore would rather collaborate with these countries than African countries. Furthermore, the French language barrier remains a significant challenge for North African countries, where effective and clear communication with Anglophone countries is often difficult. Similar to the other regions, North Africa also has excellent Water and Sanitation related policies and well aligned with high level continental guiding frameworks, ‘on the ground’ policies are often not aligned, while implementation mainly due to political will remain one of the major challenges. Nevertheless, it can be stated that there is a close alignment between continental and global policies, and more misalignments between local and national policies. This therefore shows a gap, as well as a recommendation for closer collaborations between local and regional enablers in North Africa.
Other relevant policy frameworks in North Africa, towards water and sanitation-related research come from foreign research institutions such as the United Nations towards WASH (water, sanitation and hygiene) services, UNICEF for the Middle East and North Africa, SIDA, and the European Commission. The United Nations supports the Sustainable Developmental Goals and it was found that eight countries between North Africa and the Middle East lacked equitable and adequate WASH facilities that met minimum standards in more than 50% of schools (Source: https://www.unicef.org/mena/wash). With these objectives, there is an overall theme of improved service delivery, transforming WASH policies for innovation, policy planning, and budget allocations.

According to the UNICEF regional focus on North Africa and the Middle East, there is a key theme for clean drinking water, water quality assurance, renewable water resources and freshwater, water availability and gender roles in household contexts, especially where women and children are concerned. There is a close alignment between UNICEF and SDGs due to the objective of universal and equitable access to safe and affordable drinking water for all by 2030; additionally to achieve access towards equitable and adequate sanitation and hygiene for all, with a special focus on the needs of women and girls in vulnerable situations (Source: https://www.unicef.org/mena/wash).

17.6.4 Recommendations

The section below describes role-players, organisations, institutions and networks in Northern Africa, as well as recommendations for research and collaboration in the region.

- Egypt is considered both as a North and East African country which is an important recommendation and gap because of the Nile River Basin. Closer collaborations among regional countries in North Africa can aid in social issues related to war, conflict, political violence and poverty. In water and sanitation, there are gaps for further research such as sustainable development, freshwater resources, groundwater availability and hygiene. An important recommendation related to Egypt is also the regional links to both North and East African countries, and this is significant for capacity-building and regional collaboration. This also offers as a regional gap between North and East Africa.

- Due to the lack of findings in Sahrawi Arab Democratic Republic and the Islamic Republic of Mauritania from Web of Science, there is great research prospects. Notable areas for research interventions pertain to drinking water quality and resources, sustainable resource management and groundwater availability. Not only does this highlight a regional gap within North Africa, but also showcases research, socioeconomic and political prospects for regional collaboration.

- There are more international enablers towards water and sanitation-related research in North Africa than from the African continent. This provides an opportunity for more engagement and closer integration for regional countries in North Africa. This shows an implication for the long-term effects of foreign funding that can complication solutions around nation-building and regional engagements.

- Research prospects in clean drinking water and water quality assurance; groundwater use, and adequate sanitation and hygiene.

- Greater research prospects overall in the water and sanitation sector also points to water availability, infrastructure and accessibility in new urban areas and megacities.

- The establishment of a research and knowledge information management system/database that will allow for better mobilising of resources and knowledge sharing within the region. This is especially important in also linking the continent and other regions as countries such as Egypt are in the Northern region but are incredibly reliant on the Nile River system which is predominantly in Eastern Africa. This is especially important in the context of recent tension between countries regarding the development of dams and other water infrastructure.
18 WAY FORWARD

Referring to Section 17, detailed recommendations are proposed at a continental and at regional levels to address water and sanitation issues across Africa. In this section, we would like to highlight a couple of issues which could be relevant for the WIA to consider in moving forward.

1. It is important that moving forward, the African Ministers Council on Water (AMCOW) should play an important role to coordinate and facilitate engagements with various regional role-players, considering AMCOWs’ role in the continent. Here the WIA could engage with AMCOW Secretariat in Abuja, Nigeria to get buy-in and guidance on how to expand the WIA into other regions of the continent.

2. An opportunity exists for the WIA to play a role to advocate specific regional and national priorities, for example highlighting priorities which are pertinent to the region. Here, the RECs and RBOs should play an important role in establishing Regional Research Agendas with the WIA playing a convening role to engage different role-players.

3. One should not underestimate the advocacy-role the WIA could play in various regions. Here, the WIA could advocate cooperation between various role-players which have different mandates in the various regions.

4. Financing water and sanitation research remain a challenge and often linked to specific mechanisms such as the WRC in South Africa, where political will played a significant role in establishing such a mechanism. The funding gap is currently often filled by funding institutions beyond Africa in the Global North, which also leads to many African countries not able to assert their own research agendas. While it is important to strike a balance between local and international funding, the WIA could play a role in sharing experiences for example from the South African WRC, for benchmarking and potential uptake in other African countries.

5. Duplication in water and sanitation research are also a challenge in various African countries and in addition, projects often end at the pilot phase, without any upscaling of successes. Here the WIA could potentially playing a role in sharing knowledge platforms such as the WRC Knowledge Hub with other countries/regions to identify existing research and knowledge sharing. This should be undertaken considering existing platforms which might exist.
19 BIBLIOGRAPHY


20 ANNEXURE A: KEY ENABLERS BY REGION – CONTACT DETAILS

Africa

- European Commission
  [https://ec.europa.eu/info/index_en; 00 800 67 89 10 11 / +32 2 299 96 96](https://ec.europa.eu/info/index_en; 00 800 67 89 10 11 / +32 2 299 96 96)
- USAID
  [https://www.usaid.gov; 202-712-4300; acvfa@usaid.gov](https://www.usaid.gov; 202-712-4300; acvfa@usaid.gov)
- World Bank
  [https://www.worldbank.org/en/home; (202) 473-1000; hroperations@worldbank.org](https://www.worldbank.org/en/home; (202) 473-1000; hroperations@worldbank.org)
- Bill and Melinda Gates Foundation
  [https://www.gatesfoundation.org; (206) 709-3400; media@gatesfoundation.org](https://www.gatesfoundation.org; (206) 709-3400; media@gatesfoundation.org)
- Consultative Group on International Agricultural Research (CGIAR)
  [https://www.cgiar.org; +33 4 67 04 75 75; contact@cgiar.org](https://www.cgiar.org; +33 4 67 04 75 75; contact@cgiar.org)
- United Kingdom Research and Innovation (UKRI)
  [https://www.ukri.org; 00 32 2 230 1535 / 5275; communications@ukri.org](https://www.ukri.org; 00 32 2 230 1535 / 5275; communications@ukri.org)
- African Ministers’ Council on Water (AMCOW)
  [https://amcow-online.org; secretariat@amcow-online.org ; +234 9096074166; info@amcow-online.org](https://amcow-online.org; secretariat@amcow-online.org ; +234 9096074166; info@amcow-online.org)
- Africa Water Association (AfWA)
  [https://www.afwa-hq.org/index.php/en; (+225) 22 49 96 11 / (+225) 22 49 96 13; contact@afwa-hq.org](https://www.afwa-hq.org/index.php/en; (+225) 22 49 96 11 / (+225) 22 49 96 13; contact@afwa-hq.org)
- Africa River Basin Organisations (ANBO)
  [https://www.un-igrac.org/special-project/anbo; +31 15 215 2325; info@un-igrac.org](https://www.un-igrac.org/special-project/anbo; +31 15 215 2325; info@un-igrac.org)
- Forum for Agricultural Research in Africa (FARA)
  [https://farafrica.org; +233 0302 74488; info@farafrica.org](https://farafrica.org; +233 0302 74488; info@farafrica.org)
- CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development)
  [http://www.coraf.org; (+221) 33 869 96 18; infos@coraf.org](http://www.coraf.org; (+221) 33 869 96 18; infos@coraf.org)
- International Water Management Institute Africa (IWMI)
  [https://www.iwmi.cgiar.org; +94 11 2880000, 2784080; iwmi@cgiar.org](https://www.iwmi.cgiar.org; +94 11 2880000, 2784080; iwmi@cgiar.org)
- Arab Bank for Economic Development in (BADEA)
  [https://www.badea.org; +202-2-4502021; badea@badea.org](https://www.badea.org; +202-2-4502021; badea@badea.org)

Southern African

- Water Research Commission (WRC)
  [http://www.wrc.org.za; +27 12 761 9300; info@wrc.org.za](http://www.wrc.org.za; +27 12 761 9300; info@wrc.org.za)
- National Research Foundation (NRF)
  [https://www.nrf.ac.za; +27 (0)12 481 4000; info@nrf.ac.za](https://www.nrf.ac.za; +27 (0)12 481 4000; info@nrf.ac.za)
- WaterNet
  [https://www.waternetonline.org; +263 4 336725/333248; mmakopa@waternetonline.org](https://www.waternetonline.org; +263 4 336725/333248; mmakopa@waternetonline.org)
- AUDA-NEPAD SANWATCE
WatSanNet – AFRICA STUDY

https://nepadwatercoe.org/; +27 21 808 9381; ne@sun.ac.za

- Cap-Net
  https://cap-net.org/; themba.gumbo@cap-net.org

Central

- Swiss National Science Foundation (SNSF)
  https://www.snf.ch/en; +41 31 308 22 22; desk@snf.ch

- Belgian Technical Cooperation (BTC)
  https://www.enabel.be/content/nous-sommes-enabel-1; +32 (0)2 505 37 00;
  first name.name[at]enabel.be

East

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
  https://www.giz.de/en/html/index.html; +49 228 44 60-0; info@giz.de

- United Nations Educational, Scientific and Cultural Organization (UNESCO)
  https://en.unesco.org/

North

- French National Research Agency
  https://anr.fr/en/; +33 178 098 000; firname.lastname@anr.fr

West

- Swedish International Development Agency (SIDA)
  https://www.sida.se/en; +46 (0)8 – 698 50 00; sida@sida.se

- OMVS - Senegal River Basin Development Organization
  http://www.omvs.org/; +221 33 859 81 82; omvssphc@omvs.org

- French Development Agency
  https://www.afd.fr/en; +33 1 53 44 31 31;
21 ANNEXURE B: LIST OF ENABLERS BY TYPE

19.1 Programmes and Networks

Note that these are ALL enablers, whereas country profiles (Section 14) only include the top five/six enablers. I.e. many of these enablers below would not be found under the country profiles.

  - Southern African Network of Water Centres of Excellence (SANWATCE)
  - Western African Network of Water Centres of Excellence (WANWATCE)
  - Central/Eastern African Network of Water Centres of Excellence (CEANWATCE)
- AfriAlliance - https://afrialliance.org
- WaterNet - https://www.waternetonline.org/
- Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) - https://www.sasscal.org
- Western African Science Service Centre for Climate Change and Adaptive Land Management (WASCAL) - https://wascal.org
- Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) - https://www.ruforum.org
- Pan African University (PAU) - https://pau-au.africa
- Rural Water Supply Network (RWSN)
- Cap-NET - https://cap-net.org
- Applied Centre for Climate & Earth System Science (ACCESS) - https://www.access.ac.za
- Climate Resilient Infrastructure Development Facility (CRIDF) - https://cridf.net
- Alliance for a Green Revolution in Africa (AGRA) - https://agra.org/

19.2 Societies, associations and academies

- Women in Water and Sanitation Association (WIWAS) - https://wiwas.org/about-wiwas/
- Water Institute of Southern Africa (WISA) - https://wisa.org.za/
- South African Young Water Professionals (YWP ZA) - https://wisa.org.za/empowerment/young-water-professionals-ywp/
- ANEW – Sareen Malik -ES. Continental Representative Civil Society network

19.3 International Organisations

- Global Water Partnership - https://www.gwp.org
- International Water Management Institute Africa (IWMI) - https://www.iwmi.cgiar.org
19.4 Regional and Continental bodies

- African Ministers’ Council on Water AMCOW – Abuja - https://amcow-online.org
- Intergovernmental Authority of Development (IGAD) - https://igad.int
- Forum for Agricultural Research in Africa (FARA) - https://faraafrica.org/
- CORAF / WECARD (West and Central Africa Council for Agricultural Research and Development) - http://www.coraf.org/
- AGRHYMET - http://agrhymet.cilss.int/
- The International Congo-Ubangui-Sanga Commission (CICOS) - https://www.cicos.int
- SADC Water Division - https://www.sadc.int/themes/natural-resources/water/

19.5 National Research and Innovation Units

- South African National Research Foundation (SA-NRF) - https://www.nrf.ac.za
- Council of Scientific and Industrial Research (CSIR) (India) - https://www.csir.res.in/

19.6 Government

- Centre National d’Etudes Spatiales (CNES) - https://cnes.fr/en
- National Institutes of Health (NIH) - https://www.nih.gov
- National Science Foundation (NSF) - http://www.nsf.gov/
- UNICEF in Zambia - https://www.unicef.org/zambia/
- United States Department of Health and Human Services - https://www.hhs.gov
- Federal Ministry of Education Research (BMBF) - http://www.bmbf.de/
19.7 International Research and Innovation Units

- Alexander Von Humboldt Foundation - https://www.humboldt-foundation.de/
- Institut de recherche pour le développement IRD - https://en.ird.fr/node/8
- Max Planck Society Innovation Fund - https://www.mpg.de/knowledge-transfer/max-planck-innovation
- Medecins sans Frontieres (Doctors Without Borders) - https://www.msf.org
- NIH National Center for Advancing Translational Sciences (NCATS) - https://ncats.nih.gov
- International Foundation for Science - http://www.ifs.se
- Economic Social Research Council, Natural Environment Research Council, United Kingdom Research and Innovation (UKRI) - https://www.ukri.org
- National Natural Science Foundation of China (NSFC) - http://www.nsfc.gov.cn/english/site_1/index.html
- Ecole Nationale Superieure D Agronomie - http://www.ensa.dz/
- French agricultural research and cooperation organization (CIRAD) - https://www.cirad.fr/en
- Consultative Group on International Agricultural Research (CGIAR) https://www.cgiar.org
- Stanford Hispanic Center of Excellence Postdoctoral Fellowship

19.8 Philanthropy

- Bill and Melinda Gates Foundation - https://www.gatesfoundation.org/
- Welcome Trust - https://wellcome.org/
19.9 Financial Institutions

- Arab Bank for Economic Development in Africa (BADEA) - http://www.badea.org/
- Islamic Development Bank - http://www.isdb.org/
- African Development Bank (AfDB) - https://www.afdb.org/en

19.10 Universities

- Universite De Sfax; Ecole Nationale Dingenieurs De Sfax Enis - http://www.enis.rnu.tn/
- University of Bonn - https://www.uni-bonn.de/en/university/
- University of Lome - https://en.univ-lome.tg/
- Sherrilyn and Ken Fisher Center for Environmental Infectious Disease of the John Hopkins School of Medicine - https://hopkinsinfectiousdiseases.jhmi.edu/research/research-areas/environmental-id/
- University of North Carolina - http://www.northcarolina.edu/
- Colorado State University - https://www.colostate.edu
- Manchester Metropolitan University - http://www.mmu.ac.uk/
- West African SCI Serv CTR Climate Change Adapte
- Ecol Applicata Italia
- Ghent University - https://www.ugent.be/en
- Lancaster University - https://www.lancaster.ac.uk/
- National Research Institute for Agriculture (INRAE) (France) - https://www.inrae.fr/en
This study aims to understand who the role-players are, their mandate, geographical scope and how they are aligned with regional, continental and global agendas specifically concerning the water and sanitation sector. This knowledge will identify gaps and alignment between initiatives and provide recommendations on strategic gaps which can be addressed. One tool utilised in this study is this questionnaire disseminated to 1.) funders of Water and Sanitation research and 2.) beneficiaries of such funding. The following themes are covered in the questionnaire:

- Research Associations, Forums and Networks
- Policy Environment (Domestic, Regional, Continental and Global)
- Funding Sources
- Policy and Strategies
- Research Priorities
- Relationships (Other organisations, policymakers and funders)

1. Participant information

1.1. Please select your country

1.2. What is your gender?

1.3. What is your email address?

1.4. Please select the option that best describes you or your organisation's role in the water sector.

I am, or part of an organisation which PRIMARILY support the African Water and Sanitation sector. An 'enabler' is considered as a person or organisation that provides funding, contributions to policy,
NGO’s, Government agencies, Developmental partners, research networks, etc. and might generate or receive funding and support from own funding or external sources for their activities.

Examples include AMCOW, Regional Economic Communities (RECs), Water Research Commission, National Research Foundations, River Basin Organisations (RBOs), UNESCO, WaterAid, WaterNet, AUDA-NEPAD SANWATCE, GWP, SIWI, AfWA etc.

I am a beneficiary/part of an organisation that primarily RECEIVE support within the African Water and Sanitation sector. A beneficiary is considered as a person or entity who received benefits or money from a benefactor.

1.5. Which of the following options best describe your organisation?

- Government Department
- Higher Education Institution
- Independent Research Unit
- NGO (non-profit)
- Private Sector
- TVET (Technical and Vocational Education and Training College)

1.6. Which of the following options best describe your current role?

- Lecturer
- Researcher
- Student
- Executive Project / Programme Manager
- Administrative
- Financial

2. Funding information (beneficiaries)

You have indicated that you are / your organisation is a BENEFICIARY of Water and Sanitation-sector support. Please tell us a bit more about the support received by you / your organisation.

2.1. What is the name of the institution or organisation you are affiliated with?

2.2. What is the name of your specific unit/centre/department?
2.3. What is your primary field of activity?

Agricultural Sciences
Economic and Business Management Sciences
Education
Engineering, Hydrology and the Built Environment
Data Science/Information Technology
Health Sciences
Social Sciences
Science
Climate change, Climate resilience
Non-academic

2.4. Please indicate in which areas your / your organisation's activities are located (select up to three options/fields)

Agricultural Water – Agroforestry
Agricultural Water – Aquaculture
Agricultural Water – Commercial irrigation
Agricultural Water – Rainwater harvesting
Agricultural Water – Smallholder irrigation
Drinking water – Water loss
Drinking water – Water supply
Drinking water – Water treatment
Ecosystem – Biodiversity protection
Ecosystem – Biomonitoring
Ecosystem – Climate Change
Ecosystem – Invertebrates
Ecosystem – Resource Economics
Mine water – Closure and rehabilitation
Mine water – Impact prediction
Mine water – Mine water treatment
Mine water – Tailings facilities
R & D – Information technology
R & D – Methodology
R & D – Research capacity
R & D – Water and Energy
R & D – Water history
Sanitation – Hygiene
Sanitation – On-site sanitation
Sanitation – Waterborne sanitation
Strategic Plans
Wastewater Management – Agricultural
Wastewater Management – Domestic
Wastewater Management – Industrial
Wastewater Management – Sewers
Wastewater Management – Sludge management
IWRM – Catchment Management
IWRM – Dams (Impoundment)
IWRM – Hydrogeology
IWRM – Planning and development
IWRM – Water Governance

2.5. In recent years, which organisation(s) are the main supporters/funders of your activities? Please provide details. (space for up to 5 funders). During of funding and approximate amounts.

2.6. Is your Organisation/Unit part of any larger Water and Sanitation networks/associations/partnerships in the region or across Africa?

2.7. What is the name(s) of the larger network(s) or partnerships?
2.8. If available, please add the URLs to these networks' websites.

3. **Enablers**

Information: You have indicated that you are / your organisation is an ENABLER / SUPPORTER / FUNDER of Water and Sanitation-sector related activities. Even though you might receive funding from external sources. Examples include AMCOW, Water Research Commission, WaterNet, AUDA-NEPAD SANWATCE, GWP, SiWI, AfWA. Please tell us a bit more about your organisation.

3.1. What is the name of your specific department/unit if applicable?

3.2. What is the name of your specific faculty/department/division?

3.3. Please enter the web address (URL)

Information: We would like to understand where and how you or your organisation’s support for Water and Sanitation-related activities are awarded and distributed across Africa. For French. For Portuguese

Please tell us about your MANDATE

3.4. What is your organisational MANDATE with regards to Water and Sanitation support?

- Provide policy enabling environment
- Inform policy
- Provide funding for research
- Provide funding for training/capacity development
- Undertake high-level research
- Undertake training/capacity development
- Provide dialogue opportunities
- Provide opportunities for engagement with government

3.5. Briefly, what is your organisation’s STRATEGIC OBJECTIVES with regards to Water and Sanitation support? Objectives are usually set to achieve a higher goal, in this case, a mandate. Objectives are usually set to achieve a higher goal, in this case, a mandate.
3.6. If available, please upload an information document (brochures, leaflets, pamphlets, marketing and advertising), elaborating your organisation/unit/division's MANDATE.

3.7. Which of the following factors determine/guide your organisation's Water and Sanitation support?

- Geographic location
- National) and/or international political agendas
- Water and Sanitation policy frameworks
- Goodwill
- Patents
- Financial
- Corporate responsibility
- Social responsibility
- Sponsors

3.8. With a focus on support on the African continent, what is the geographic scope of the funding distributed for Water and Sanitation activities?

- Local
- Provincial
- District
- National
- Regional

3.9. Please elaborate on your choice above. E.g. Regional - in SADC or East Africa

3.10. Please indicate the number of years your organisation have been supporting the sectors. Water and Sanitation field provided and the number of years.

3.11. On average, how many Water and Sanitation related projects do your institution support annually?

3.12. Based on the last five years, what is the average annual budget available for support for such activities? In US$
3.13. Was your organisation one of the funders?

3.14. If applicable, what are OTHER sources of external funding for your organisation?

3.15. To the best of your knowledge, do your organisation’s activities align with the listed policies/frameworks?

   Agenda 2063
   Science, Technology and Innovation Strategy for Africa (STISA-2024)
   SDGs, with a special focus on SDG6
   SADC Water Research Agenda
   Other...

3.16. Is your organisation part of any larger networks/associations/partnerships in the region or across Africa?

3.17. If yes, please type the names of these network(s) or partnerships here.

3.18. If possible, please provide the URL web address of the network.

3.19. Is your organisation a COORDINATOR or HOST of any larger structured networks/associations/partnerships in the region or across Africa?

Thank you for taking the time to complete the survey, it is much appreciated.

if you may have any questions or concerns please feel free to contact:

Dr. Nico Elema | ne@sun.ac.za | Tel +27(0)21 808 9381

Mr. Carinus de Kock | dekockc@sun.ac.za | Tel +27(0)21 808 9795
### ANNEXURE D (JOURNALS IN THE ‘WATER RESOURCES’ CATEGORY OF WOS (Web of Science) - 2019)


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24 ANNEXURE E (SEMI-STRUCTURED INTERVIEW)

Themes:
1. Research Associations, Forums and Networks
2. Policy Environment (Domestic, Regional, Continental and Global)
3. Funding Sources
4. Policy and Strategies
5. Research Priorities
6. Relationships (Other organisations, policymakers and funders)

Potential Questions:
1. Are you or your organisation a member of any water and sanitation research associations? How has this impacted your research?
2. Do you or your organisation participate in any water and sanitation research forums? How has this impacted your research?
3. What water and sanitation research networks do you or your institution/organisation belong to? How has this impacted your research?
4. Do you know what your institution's/organisation's research strategies and policies are?
5. If Yes - How does the research strategy/policies of your institution/organisation impact your research?
6. If No/Hesitant - What, besides your interest, guides your research endeavours?
7. Are there domestic priorities, strategies or policies that influence your research as an individual and as an institution/organisation?
8. Are you or your organisation influenced by continental and global strategies/policies such as the Agenda 2063 or the Sustainable Development Goals?
9. If Yes – What are your or your institution's/organisation's reasons for using these specific strategies and policies to inform your own?
10. What are your main sources of funding? (Government, Science Council, International Agency, NGO etc).
11. Has this changed over time since the beginning of the institution/organisation or since you first began being involved?