Mainstreaming water resources management in UN Sustainable Development Cooperation Frameworks in Africa

### Database Compendium: open-access data sources for water resources and ecosystem management

This Database Compendium is intended to be used by UNEP Africa Office staff and partners to support UN Country Teams in the identification of relevant datasets, and how to use them, in support of:

1. Inputs to Common Country Assessments (CCAs)
2. Review, design, and tracking implementation of Cooperation Frameworks (CFs)
3. Identification of priority country issues that may be used in informing additional support from UNEP to countries.

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| Data source | Comments |
| Primary portals for SDG 6 and related data |
| SDG 6 Data Portal - UN-Water, <https://sdg6data.org/> | Contains all the latest SDG 6 indicator data, and much more water-related data, in one place, in multiple languages (e.g. English, French, Arabic, Portuguese, and even other local languages via Google Translate). * Downloadable “[Country snapshots](https://sdg6data.org/snapshots?country=#demo-wrapper)” are probably the key ‘go-to’ resource that are likely to be most frequently used for inputs to Common Country Assessments (CCAs). They provide the most easily digestible information on each SDG 6 indicator. Trends are shown, sometimes going back 20 years. For example, they can be used to make the case for action on certain areas, by showing insufficient progress towards a target. The country snapshots may also be useful in the design of a Cooperation Framework, or for monitoring implementation of Cooperation Frameworks, where SDG indicators can be used.The country snapshots (or extracts from them) may also be useful for communication with various audiences.
* Maps, charts and tables (selected from the main menu bar), allow you to view various data and indicators in various formats. In addition to SDG 6 indicators and 11.5 indicators (on disasters), there are many related data and indicators for example: many sub-indicators (for example sectoral water use, area equipped for irrigation, dam potential, ODA provided on various aspects of water management); economy (e.g. GDP from agriculture); society (e.g. population density, poverty data); and environment (e.g. forest cover). These could also be used for example to compare countries on particular indicators, e.g. to illustrate if a country is significantly below a regional or sub-regional average. Always click on “View selection” to update the view if you have changed the indicators or geographical area.
* The [Data Lab](https://sdg6data.org/data-lab) function allows you to identify countries that meet various criteria by using filters on the data and indicators in the portal. For example, you can identify all countries in Africa that have >50% of water bodies with good ambient water quality (SDG 6.3.2). This function may be useful in regional and sub-regional planning and prioritisation.

Reliability and update frequency: High. All UN custodian agencies feed data into the portal, coordinated by UN-Water through the SDG 6 Integrated Monitoring Initiative (IMI). Typically updated after IMI data drives, approximately every 3 years. Limitations: data is only available if the country has officially reported on the SDG indicators through the custodian agencies (though coverage is generally quite high).  |
| IWRM Data Portal, UNEP, <http://iwrmdataportal.unepdhi.org/>  | Contains all data, information and reports in relation to SDG 6.5.1 on IWRM implementation. Perhaps most importantly, the completed [country surveys](http://iwrmdataportal.unepdhi.org/countrydatabase) can be downloaded, and these provide ‘status description’ and ‘way forward’ on 33 different aspects of water resources management at national, sub-national and basin levels. The country surveys provide valuable ‘summary’ data sources for country priorities and issues. Two-page summaries, with results only, are also available in multiple languages, and may be useful communication material, e.g. to communicate particular challenges/gaps in country capacity. Limitations: level of information provided varies significantly between countries, depending on the level of priority given to the reporting exercise by the countries, and the level of stakeholder engagement.  |
| SDG661app, UNEP,<https://www.sdg661.app/>  | Contains more detailed data, maps and charts on SDG 6.6.1 and various sub-indicators and parameters, including: permanent and seasonal changes in water in rivers, lakes, and reservoirs; current wetland extent; lakes layer. For most sub indicators 20 years of data is available across the globe with a resolution down to 30 x 30 meters.This portal may be more useful for more detailed analysis and planning with government and non-government stakeholders. Data is based on Earth Observations, so may fill ‘gaps’ where ground data doesn’t exist or is old. Governments are asked to ‘verify’ the EO data as part of 661 reporting. The portal is fairly ‘technical’, so is more likely to be used by ‘practitioners’ rather than policy makers, though outputs from the portal (e.g. maps and figures) can be packaged and presented to policy makers. Reliability: Generally high, dependent on various factors, including level of data available to ground-truth EO data. Update frequency: Updated annually.  |
| Other water-related portals |
| * Water and Sanitation Sector Monitoring and Reporting System ([WASSMO](https://www.africawat-sanreports.org/Ui)), African Ministerial Council on Water (AMCOW): contains relevant SDG data as well as indicators and data relevant to African political targets. Also includes sanitation indicators related to the AfricaSan Ngor Declaration. Limitation: some discrepancies exist with SDG data reported through ‘official’ channels; significant data gaps. UNEP-DHI support AMCOW with this portal.
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| Overarching SDG portals  |
| * [**SDG Tracker**](https://sdg-tracker.org/)**:** global portal, for all countries and indicators. Quite comprehensive and reliable. Recommended.
* Africa UN [Data for Development Portal](https://ecastats.uneca.org/africaundata): includes data related to SDGs, Agenda 2063, “Key Datasets” (e.g. socioeconomic data), and UN Data Sources (in relation to different agencies and regional commissions). [Launched](https://www.undp.org/africa/press-releases/un-launches-first-regional-online-portal-bring-together-all-african-countries-data-and-evidence-sustainable-development) September 2021. Very promising, comprehensive portal, but to be used with caution as significant data gaps still apply. When using, check ‘original’ data sources for more recent data.
* AfDB’s [Monitoring SDGs in Africa](https://sdg.opendataforafrica.org/): shows all SDG data, but significant data gaps exist. Not recommended for use at time of writing.
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| Transboundary information |
| * Transboundary River Basins [portal](http://twap-rivers.org/indicators/): contains 15 transboundary indicators, and related sub-indicators, on water quantity, water quality, ecosystems, governance and socioeconomics, as well as projections for some indicators for 2030 and 2050. Also contains other data such as transboundary rivers, basins, basin-country-units, withdrawals, and runoff. Limitation: much of the data used for the indicators is from 2010, though the database remains one of the most comprehensive, and is still widely referenced.
* SDG [6.5.2](https://www.sdg6data.org/indicator/6.5.2)
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| UNEP-DHI tools and services |
| * Water Tools Portal: portals can be created for user-specific locations, which allow the user to access different web applications to inform and support planning and management of sub-national, national, and transboundary water resources. The available applications can be used to guide technical analysis, consultations processes and result dissemination to stakeholders in a variety of ways. Available applications include: data monitor; planning; indicators; root cause analysis; documentation. Various examples of where the portals have been developed include the [SECCCI project](https://www.unepdhi.org/seccci-information-portals/), including Kenya, [Somalia](https://watertools-portal.azurewebsites.net/portal/workspaces/somalia%2Band%2Bjuba-shabelle%2Bbasin), and Sudan.
* Macroplastic [risk and warning system](https://www.unepdhi.org/global-assessment-of-macroplastic-litter/): developed by UNEP-DHI in collaboration with the UNEP Freshwater Ecosystems Unit for the Global Partnership on Marine Litter (GPML).
* Match! Water Solutions [Portal](https://www.matchwatersolutions.com/): an online tool that brings together water managers facing water challenges, with technology providers with solutions ranging from the simple to the sophisticated, and from low-tech to hi-tech.
* UNCCD [Drought Toolbox](https://www.unepdhi.org/unccd-drought-toolbox/): provides drought stakeholders with easy access to tools, case studies and other resources to support the design of National Drought Policy Plans with the aim to boost the resilience of people and ecosystems to drought.
* [Flood and Drought Portal](https://www.unepdhi.org/flood-and-drought-portal-2/): enables users to access technical applications to support planning for flood and drought events. Includes historical trends, near-real time data, and forecasts. Applications include: Issue Analysis, Water Indicators, Data and Information, Drought Assessment, Crop Application, Flood Assessment, Basin Planning, Water Safety Planning, Robust Decision Making Tool. Automated reporting tools are also available. More location specific applications have been developed for Ghana, Volta River Basin, Lake Victoria Basin, and more recent development through the Water Tools Portal has included the Dawa-Jubba-Shabelle river basins and Omo-Turkana river basins through the [SECCCI](https://www.unepdhi.org/seccci-information-portals/) project.
* [Global Hydrological Model](https://www.dhigroup.com/data-portals/global-hydrological-model): a subscription-based data portal that provides high spatial resolution data instantly without the need for additional simulations. It's perfect for planning river operations, as well as for analysing flood and drought indexes and the impacts of river discharges. You can even use it for studies that require finer resolution and local datasets.
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| Potential datasets by topic |
| The topics below represent a long-list of potential areas of interest for countries with respect to Cooperation Frameworks and Common Country Analyses. Many of these areas are covered by the above databases. This list may be further developed over time, pending demand from UNEP Africa Office personnel and other partners. Any databases listed are either global or regional. Note that one of the limitations of global or regional datasets is that they typically present national averages. This does not allow for the identification of hotspots within a country. National level datasets are typically needed for this, and these are covered in the next section.  |
| * Water availability/scarcity, including projections: SDG 6.4.2 ([SDG 6 Data Portal](https://sdg6data.org/), [Aquastat](https://www.fao.org/aquastat/en/databases/)\*)
* Sectoral Water Demands (SDG 6 Data Portal, Aquastat), potentially linked to how different sectors rely on water resources/freshwater ecosystems (e.g. “Gross value added to GDP”, broken down by sector, available for some countries in the SDG 6 Data Portal)
* Environmental Water Requirements (EWR) (SDG 6 Data Portal)
* Socioeconomic:
	+ GDP from various sectors, including agriculture
	+ Links between economy and environment
	+ Impacts of climate change (e.g. on Agriculture; Water Resources, Human Health; Energy; Infrastructure; Land Resources, Fisheries, Forestry, Wildlife, Industry, and Tourism).
	+ Main crops and reliance on water / resilience to change
* Groundwater: depletion and recharge, pollution: SDG 6 Data Portal; IGRAC: [Africa Groundwater Portal and SADC Hydrogeological Map and Atlas](https://www.un-igrac.org/special-project/africa-groundwater-portal); Global Groundwater Information System ([GGIS](https://www.un-igrac.org/global-groundwater-information-system-ggis)), [Western Africa](https://www.un-igrac.org/stories/groundwater-fast-growing-cities-western-africa) study.
* Water quality / pollution: point sources (e.g. industrial/commercial/urban), and diffuse (e.g. agricultural/rural); emerging pollutants
* Changes in ecosystem extent/quality: wetlands (SDG 661app); forest cover; land degradation / desertification; soil loss; biodiversity
* Dependence on biomass for power/heating/cooking (linked to deforestation, and electrification rates)
* Proportion of wastewater treated, and reused (SDG 6.3.1, SDG 6 Data Portal)
* Protected area extent and trends
* Forest cover and trends (deforestation) (SDG 6 Data Portal)
* Floods and droughts:
	+ National datasets
	+ Flood and Drought Portal (this would require a bit of training)
	+ Needs for sub-national identification of hot-spots
	+ Social and economic impacts
	+ Could be recent ‘records’ to indicate current/increasing severity (e.g. record rainfalls, water levels, temperatures).
* Climate change projections and impacts on e.g. floods, droughts, water distribution, availability, and quality, health, conflict
	+ National data and studies
	+ Flood and Drought Portal
	+ Eastern Africa: IGAD [ICPAC](https://www.icpac.net/) (IGAD Climate Predictions and Applications Centre)
* Potential water/ecosystem/climate related conflict risk: Water, Peace and Security [map](https://waterpeacesecurity.org/map) (including ‘Conflict Forecast’ and Areas Experiencing Drought’), with more detailed assessments in Mali, Kenya and Ethiopia. See also UNEP’s [Environment Security](https://www.unep.org/explore-topics/disasters-conflicts/what-we-do/environment-security) workstream.
* Damages from water-related disasters (and/or climate impacts): economic losses (SDG 11.5.1) (potentially broken down by sector, e.g. agriculture, energy) and lives lost/impacted (SDG 11.5.2)
* Pollution & health (air and water pollution): including ambient water quality (SDG 6.3.2); plastic pollution; waterborne diseases; impacts of climate change)
* Solid waste, in relation to pollution, and resources use.
* Marine/coastal ecosystems (e.g. mangroves, and including resilience to flooding / sea level rise).
* Reservoirs and dams: current, potential, planned, under construction
* Transboundary collaboration / risk: “External” renewable water resources: i.e. proportion of water available in a country that originates from outside national borders (and therefore the need for transboundary cooperation to ensure upstream supply) (Aquastat).
* Governance arrangements:
	+ laws, policies, plans, institutions, management, financing (SDG 6.5.1 IWRM surveys).
	+ Efforts to address climate change (NDCs) and environmental degradation.
	+ Transition to green economy
* Potentially relevant SDGs (beyond SDG-6): 11.5, 15.1, 15.2, 15.3, 15.b.1
* Implementation with respect to other global / regional frameworks and targets: Sendai, CBD (post-2020), sub-regional (e.g. ECOWAS, SADC, IGAD), regional (e.g. AMCOW, AU),
* Progress with regard to national development plans and targets (national datasets, but needs identification/mapping of relevant targets).
* Dimensions related to gender and vulnerable groups.

\* a note on Aquastat: data is generally dependent on inputs from countries, or estimates are inferred (e.g. through modelling), and there can be significant gaps or inconsistencies in the data. Caution should be exercised when using the Aquastat database, and the ‘original’ datasets from national, regional, or global databases should be used wherever possible.  |

## Country-specific data sources

The intention with this section is that it may be further developed and updated in subsequent phases of this initiative, with country partners. If there is a need from the country for support with developing or refining their monitoring, data and information management systems, UNEP (through UNEP-DHI), may be able to provide support with this (see [Strengthening UNEP’s contribution to UN Country Teams in Africa](https://docs.google.com/document/u/0/d/1y9dL-MJpWYIrzVQmvE7bWtSavxhZRGjBeWzO8LPXHRM/edit)).

**Malawi**

At the time of the initial phase of this initiative (2022), no known relevant publicly available databases had been identified.

**South Africa**

Databases in South Africa are quite comprehensive and accessible, containing most of the relevant information required. However, a certain level of knowledge is needed to navigate them and extract meaningful information for planning and communication.

* Water, sanitation and climate data resources: <https://opendataza.gitbook.io/toolkit/open-data-resources/water-and-climate-data-resources> : contains references to numerous databases, including: Department of Water and Sanitation (DWS) water information systems (in particular the [NATIONAL INTEGRATED WATER INFORMATION SYSTEM](https://www.dws.gov.za/niwis2/)); other South African water-related data sources; Sanitation services; Weather and climate; DAFF water portal; and a few global water databases.
* Hydrological Services - Surface Water (Data, Dams, Floods and Flows): <https://www.dws.gov.za/Hydrology/>

Data gaps: while data on existing dam levels is available, publicly available information on potential, planned, and under construction dams could not be located.