



Republic of Uganda
Ministry of Water and Environment

— UGANDA —
WATER SUPPLY
ATLAS 2017



FOREWORD

The Government of Uganda adopted the 2030 Agenda for Sustainable Development in 2015 which included a set of 17 Sustainable Development Goals (SDGs) that aim to end poverty, fight inequality and injustice and reverse the effects of climate change by the year 2030. These SDGs, otherwise known as the Global Goals, build on the Millennium Development Goals (MDGs) which the world aimed at achieving by 2015. Goal 6 of the SDGs, aims to ensure access to Water and Sanitation for all. Coinciding with the implementation of the National Development Plan II (NDPII) 2015/16 – 2019/20, Uganda has aligned the NDPII with Agenda 2030 by incorporating the SDGs in the country's planning framework. Under the NDPII the Government of Uganda has committed itself to increase water supply coverage in the rural areas from 65% in 2012/13 to 79% by 2019/20.

The Ministry of Water and Environment, as the lead government agency in pursuing these aspirations, also has the duty to effectively monitor, document and report progress towards the above target, for improved water service delivery. During the period 1999-2000, the Ministry of Water and Environment published its first Water Atlas which was launched in 2004. The Second Water Atlas was published in 2010. The Water Atlas has therefore become one of the most important planning tools used by the District Local governments for intra-district resource allocation for new investments for water service delivery and it also plays a major role of guiding the Ministry in strategic planning and inter-district resource allocation for new water supply infrastructure.

Since 2010, a number of changes have taken place; many new water sources have been constructed and the number of districts has increased from 80 in 2010 to 112 in 2016 together with other changes in the lower administrative units. In 2015 the Ministry therefore initiated a water supply data update exercise. In the course of this exercise, the capacity of the Ministry's Management Information System staff as well as the staff in the District Local Governments who are respon-

sible for data management on water sources was enhanced. During this exercise, the Water Supply Database, the Ministry's repository of all data related to water sources in the country, was redesigned and its functionality enhanced. In addition, each water source (namely, point water sources and piped water system as well as dams and valley tanks) were physically visited to establish its geographical location, operational status, current management structure and to gather other important parameters. This exercise was successfully completed this year and covered all the 111 District Local Governments and Kampala Capital City. The information collected in the field has been processed and analyzed by the Ministry of Water and Environment and is presented in this Water Supply Atlas 2017, using maps, charts and tables, backed up by narrative sections that are easy to understand for both technical and non-technical users.

I therefore take this opportunity to thank all Sector Development Partners, Local Governments, NGOs, the Private Sector and staff of the Ministry of Water and Environment for their interest, support and involvement during the production of this updated national Water Supply Atlas 2017. I also wish to particularly recognize the efforts of the more than one thousand people involved in collecting the data in the field and the Ministry Team that harmonized, processed and edited the data and other outputs in this Atlas.

Finally, I am confident that, like the previous Water Atlas 2010, this one will be instrumental in resource mobilization and allocation in the sector and in providing information to all the sector stakeholders at the various levels and the people of Uganda on the current situation in the provision of safe water services in the country.

For God and my country.

Hon. Cheptoris Sam
MINISTER OF WATER AND ENVIRONMENT

ACKNOWLEDGEMENT

The Uganda Water Supply Atlas 2017 has been prepared to provide stakeholders with good knowledge and information on matters concerning the current safe water supply coverage, functionality and distribution of water sources among others.

Acknowledgment goes to all the staff of the Ministry of Water & Environment especially the Management Information Systems Unit, Technical Support Units (TSUs), Rural Water Supply and Sanitation Department, Department of Urban Water and Sewerage, Water for Production and staff of the National Water & Sewerage Corporation (NWSC) who have been instrumental in the production of the Water Supply Atlas 2017.

We also would like to acknowledge the invaluable contribution of the Ministry of Local Government through the various District Water Officers that have continuously supported the data update processes throughout the country. We also applaud the over one thousand six hundred district water and extension staff involved in data collection in the field and the consultants who worked tirelessly to have this Atlas produced.

The Ministry of Water and Environment is grateful to the Water and Sanitation sub-sector Development Partners (Denmark, and Austria) who provided the required funds through the Joint Partnership Fund. The Austrian Development Cooperation is also appreciated for their additional support for provision of consultancy services in the field of database redesigning and map development.

Along with all Water and Sanitation Sub-sector stakeholders, we hope that this Atlas will be of great use in efforts towards equitable distribution of water sources, improving the efficiency and effectiveness in service delivery, reporting and accountability in the water and sanitation sub-sector.

CONTENTS

| | |
|--------------------------|-----------|
| INTRODUCTION..... | 10 |
|--------------------------|-----------|

| | |
|--------------------------------|-----------|
| EXPLANATORY NOTES | 14 |
|--------------------------------|-----------|

| | |
|------------------------------|-----------|
| NATIONAL REPORT | 19 |
|------------------------------|-----------|

| | |
|-------------------------------|-----------|
| DISTRICT REPORTS | 37 |
|-------------------------------|-----------|

| | | | | | | | | | |
|--------------------|----|-------------------|----|-------------------|-----|---------------------|-----|-----------------------|-----|
| Abim | 38 | Butaleja..... | 61 | Kasese | 84 | Lyantonde..... | 107 | Ntoroko | 130 |
| Adjumani..... | 39 | Butambala..... | 62 | Katakwi..... | 85 | Manafwa | 108 | Ntungamo | 131 |
| Agago | 40 | Buvuma..... | 63 | Kayunga | 86 | Maracha | 109 | Nwoya..... | 132 |
| Alebtong | 41 | Buyende | 64 | Kibaale | 87 | Masaka..... | 110 | Otuke..... | 133 |
| Amolatar..... | 42 | Dokolo..... | 65 | Kiboga | 88 | Masindi | 111 | Oyam | 134 |
| Amudat | 43 | Gomba..... | 66 | Kibuku..... | 89 | Mayuge..... | 112 | Pader..... | 135 |
| Amuria..... | 44 | Gulu..... | 67 | Kiruhura | 90 | Mbale..... | 113 | Pallisa | 136 |
| Amuru..... | 45 | Hoima..... | 68 | Kiryandongo | 91 | Mbarara | 114 | Rakai | 137 |
| Apac..... | 46 | Ibanda | 69 | Kisoro..... | 92 | Mitooma..... | 115 | Rubirizi | 138 |
| Arua..... | 47 | Iganga..... | 70 | Kitgum | 93 | Mityana..... | 116 | Rukungiri | 139 |
| Budaka..... | 48 | Isingiro..... | 71 | Koboko..... | 94 | Moroto..... | 117 | Serere | 140 |
| Bududa..... | 49 | Jinja | 72 | Kole..... | 95 | Moyo | 118 | Sheema | 141 |
| Bugiri | 50 | Kaabong..... | 73 | Kotido..... | 96 | Mpigi..... | 119 | Sironko | 142 |
| Buhweju | 51 | Kabale | 74 | Kumi | 97 | Mubende | 120 | Soroti..... | 143 |
| Buikwe | 52 | Kabarole..... | 75 | Kween..... | 98 | Mukono..... | 121 | Ssembabule..... | 144 |
| Bukedea..... | 53 | Kaberamaido | 76 | Kyankwanzi | 99 | Nakapiripirit | 122 | Tororo | 145 |
| Bukomansimbi | 54 | Kalangala..... | 77 | Kyegegwa | 100 | Nakaseke | 123 | Wakiso | 146 |
| Bukwo | 55 | Kaliro..... | 78 | Kyenjojo | 101 | Nakasongola | 124 | Yumbe | 147 |
| Bulambuli | 56 | Kalungu | 79 | Lamwo | 102 | Namayingo | 125 | Zombo | 148 |
| Buliisa | 57 | Kamuli | 80 | Lira..... | 103 | Namutumba..... | 126 | | |
| Bundibugyo | 58 | Kamwenge..... | 81 | Luuka | 104 | Napak..... | 127 | | |
| Bushenyi | 59 | Kanungu | 82 | Luwero..... | 105 | Nebbi | 128 | District Level Charts | |
| Busia | 60 | Kapchorwa..... | 83 | Lwengo..... | 106 | Ngora..... | 129 | (continuation)..... | 149 |

| | |
|--------------------|------------|
| ATLAS | 151 |
|--------------------|------------|

| | | | | | |
|----------------|------------------------------------|--------------------|------------------------------------|---------------------------|--|
| Abim | 172-175; 188-191 | Bukomansimbi | 326-329; 338/339 | 238-241; 256/257; 274/275 | |
| Adjumani | 158/159; 168/169; 178/179 | Bukwo | 250/251 | Ibanda | 332-335; 340/341 |
| Agago | 172/173; 186-189 | Bulambuli | 220/221; 236/237; 250/251; 254/255 | Iganga | 260/261; 276/277; 288/289; 306/307 |
| Alebtong | 200/201; 204/205 | Buliisa | 194-197; 210-213; 232/233 | Isingiro | 342/343; 354/355; 358/359; 362/363; 366/367; 370/371 |
| Amolatar | 214/215; 224/225; 228/229 | Bundibugyo | 274/275; 292/293; 312/313 | Jinja | 286-289; 304/305 |
| Amudat | 206/207; 220/221 | Bushenyi | 332/333; 348/349 | Kaabong | 152-155; 162/163; 176/177 |
| Amuria..... | 202-205; 216/217 | Busia | 276/277; 294/295 | Kabale | 368/369 |
| Amuru..... | 158-161; 168-171; 178/179 | Butaleja..... | 260-263; 276/277 | Kabarole..... | 274/275; 290-293; 312/313 |
| Apac..... | 200/201; 208/209; 214/215; 222-225 | Butambala..... | 316/317; 328/329 | Kaberamaido | 204/205; 214/215; 218/219; 228/229 |
| Arua..... | 164-169; 178-183 | Buvuma..... | 306/307; 322-325 | Kalangala..... | 328-331; 346/347 |
| Budaka..... | 252/253; 250/251 | Buyende | 228/229; 246/247 | Kaliro..... | 248/249; 260/261 |
| Bududa..... | 250/251; 264/265 | Dokolo..... | 204/205; 214/215 | Kalungu | 328/329; 338/339 |
| Bugiri | 276/277; 294/295; 306/307 | Gomba..... | 314-317; 326-329 | Kampala | 320/321 |
| Buhweju | 332/333; 340/341 | Gulu..... | 170/171; 184-187 | | |
| Buikwe | 304/305; 322/323 | Hoima | 210/211; 226/227; 232/233; | | |
| Bukedea..... | 234-237; 252-255 | | | | |

| | | | |
|--|---|--|---------------------------------------|
| Kamuli ..246/247; 270/271; 286/287 | 290/291; 308/309 | Nakasongola | 222-225; 244/245 |
| Kamwenge..... 308/309; 312/313; 332-335 | Lamwo..154/155; 160/161; 170/171 | Namayingo | 294/295; 324/325 |
| Kanungu 352/353; 360/361; 368/369 | Lira..... 186/187; 200/201 | Namutumba..... | 260/261; 276/277 |
| Kapchorwa..... 220/221; 236/237; 250/251 | Luuka | Napak.. 176/177; 188/189; 190-193 | |
| Kasese | Luwero... 244/245; 266-269; 282-285 | Napak..202/203; 206/207; 216/217 | |
| Katakwi..... 202/203; 216/217 | Lwengo.336/337; 344/345; 354/355 | Nebbi | 178/179; 194-199 |
| Kayunga | Lyantonde..... 326/327; 336/337 | Ngora...216/217; 234/235; 248/249 | |
| | Manafwa | Ntoroko | 274/275 |
| | Maracha | Ntungamo356/357; 362-365; 368-371 | |
| | Masaka 328/329; 338/339; 344-347 | Nwoya..... 178/179; 184/185; 194-197; 208/209 | |
| Kibaale | Masindi 194-197; 210-213; 222/223; 232/233; 238/239; 242/243 | Otuke..... 186-189 | |
| | Mayuge..... 306/307; 324/325 | Oyam | 184-187; 208/209 |
| Kiboga | Mbale..... 254/255; 262-265 | Pader..... 170-173; 186/187 | |
| Kibuku..... 252/253; 260/261 | Mbarara | Pallisa | 248/249; 252/253 |
| Kiruhura326/327; 334-337; 340-343; 354/355; 358/359 | Mbarara | Rakai | 344-347; 354/355 |
| Kiryandongo | Mitooma 348/349; 352/353; 356/357 | Rubirizi | 332/333 |
| | Mityana 272/273; 298/299; 314-317 | Rukungiri | 332/333; 352/353; 360/361; 364/365 |
| Kisoro..... 368/369 | Moroto..176/177; 192/193; 206/207 | Serere | 228-231; 248/249 |
| Kitgum.. 154/155; 160/161; 170-173 | Moyo | Sheema 350/351; 356/357; 362/363 | |
| Koboko..... 156/157 | Mpigi....300/301; 318/319; 328/329 | Sironko | 250/251; 254/255 |
| Kole.....186/187; 200/201; 208/209 | Mubende | Soroti.... 204/205; 216-219; 230/231 | |
| Kotido... 162/163; 172-177; 190/191 | | Ssembabule..... | 326/327; 336-339 |
| Kumi..... 216/217; 234/235 | Mukono..... 282/283; 302-305; 320-323; 330/331 | Tororo | 276-279 |
| Kween...220/221; 236/237; 250/251 | Nakapiripirit | Wakiso | 284/285; 300-303; 318-321; 330/331 |
| Kyankwanzi | | Yumbe | 156-159; 166/167 |
| | Nakaseke | Zombo | 182/183; 198/199 |
| Kyegegwa 280/281; 308-311; 326/327 | | | |
| Kyenjojo | | | |

ANNEX372

Acronyms

| | |
|---------|---|
| DLG | District Local Government |
| DWD | Directorate of Water Development |
| DWFP | Department of Water for Production |
| DWO | District Water Office/Officer |
| GPS | Global Positioning System |
| Mgt | Management |
| MWE | Ministry of water and Environment |
| MWLE | Ministry of Water, Lands & Environment |
| NWSC | National Water and Sewerage Corporation |
| QA | Question and Answers |
| RWSSD | Rural Water Supply and Sanitation Department |
| TSU | Technical Support Unit |
| UBOS | Uganda Bureau of Statistics |
| UPMIS | Utility performance Monitoring and Information System |
| UWSD | Urban Water and Sewerage Department |
| WATSUP | Water Atlas Update Project |
| WfP | Water for Production |
| WSDF | Water and Sanitation Development Facility |
| WSS-MIS | Water and Sanitation Sub-sector Management Information System |

INTRODUCTION

1. General information and objectives

The Uganda Water Supply Atlas 2017 is a result of the Water Supply Update Project II (WATSUP II) that was carried out during the Financial Years 2015/2016 and 2016/2017. This project was a follow up of the Water Supply Update Project (WATSUP) of 2010 that equally resulted in the production of the Uganda Water Supply Atlas 2010.

The WATSUP II used the existing data from Water Supply Database as a benchmark for updating the water sources inventory. This database was redeveloped into an online web-based database, accessible to the public through the Ministry of Water and Environment website, www.mwe.go.ug. In addition this Atlas also draws specific information from other databases of the Ministry of Water and Environment namely the Water for Production database and the Utility Performance Monitoring Information System database.

The WATSUP II project entailed; making physical visits to water sources, data collection, data validation, analysis and presentation through the use of maps, tables, graphs and figures. Typically, this involved updating the status of existing water sources as well as including new water sources in the inventory. These updates of water sources mainly comprised of; in-depth information such as geo-referenced locations, year of construction, source of funding, ownership, current management structure and operational status.

The core objective of this Atlas is to give an overview of the water supply situation in Uganda. A more detailed and updated Atlas is also available online through the Ministry of Water and Environment website. In addition to this, more detailed district, sub-county, parish and village information including maps, tables and specific datasets are available on request from the Ministry of Water and Environment headquarters in Luzira, Kampala.

It should be noted that this Water Atlas covers all districts as of June 2017. It covers 112 districts. The 'new' districts of Omoro, Rubanda, Kagadi and Kakumiro are also covered under their 'mother' districts of Gulu, Kabale and Kibaale. They could not be shown in this Atlas because data collection was completed before their creation.

2. The Water Atlas Up-date Project II (WATSUP II)

Maintaining an up-to-date inventory of existing water sources in Uganda is of great importance for the Water and Sanitation Subsector as it forms the basis for estimating access to safe water supply and allocation of new investments among other reasons. It is also used by government and non-govern-

ment stakeholders for purposes of policy formulation, strategic planning, resource allocation and accountability at national and both inter and intra district levels. It is also key for measuring performance and monitoring on-going activities in the sector.

It is against this background that the Ministry of Water and Environment (MWE) through its Directorate of Water Development (DWD), formulated and kick-started the Water Atlas Up-date Project (WATSUP II), which aims at up-dating the inventory of water sources among others.

The WATSUP II project was financed with funding from Development partners and Government of Uganda. This covered project implementation activities like data collection, database re-design, data analysis and information dissemination through this printed Water Supply Atlas of 2017 among many other project activities.

3. Historical background

Between 1998 and 2002 information on existing point water sources was collected by the districts with financial and technical support from the then Ministry of Water, Lands & Environment (MWLE) through a nationwide baseline survey. The collected data typically included; information on technology type, location (administrative & GPS coordinates), operational status, source of funding and ownership. With the collected data, the MWLE produced a Rural Water Atlas that included district specific information on point water sources as per 2001 and derived coverage figures. These were presented in tables, charts and maps. In parallel to the collection exercise, a database for storage and analysis of the data was developed and installed in all districts. As part of the MWE's initiative of strengthening each district with a WSS-MIS, all districts were supplied with a computer, GPS receiver and mapping software. Training was also given to District Water Officers in data collection, database management and GIS based map production. However these efforts came with challenges that hindered regular updating of the databases.

In light of this, another Water Supply Update Project was commissioned in financial year 2009/2010. At that time the ministry came up with a new baseline survey that covered the whole country. The exercise involved data collection by the District Local Government (DLG) extension staff and submission to the MWE through the Technical Support Units (TSUs). The data collected was captured into a web-based centralized database at MWE in Luzira, Kampala. This database continued to be updated on an annual basis over the subsequent years to date. This database was initially built to be an



MWE official training data collectors on how to use the data survey tools in Bududa

inventory however, along the way it was turned into a more robust database that could be used for computing indicator information at national, district and sub-county level. This shift caused the database performance to slow down. In addition this database could not readily produce an Atlas. It is due to these challenges among others that a reprogramming and redesigning exercise was undertaken with a view of building an efficient database capable of generating an online web-based Atlas.

In financial year 2015/2016 renewed efforts were devised to produce an atlas. The efforts commenced with a country-wide data collection exercise. The result of these efforts is this Water Supply Atlas 2017 along with an online atlas and database.

4. Responsibilities

District Water Officers have ultimate responsibility for collecting, managing and keeping up-to-date information on water sources at the district level. All sector players involved at the district level however, be it central-government implemented projects (both in rural and urban areas), NGOs, the private sector and self-supply developers are required to cooperate and provide the necessary information to the district water offices. During the WATSUP II project, the District Water Officers in consultation with staff from the MWE Management Information Systems Unit, were responsible for organizing data collection training, data collection, validation and quality assurance of all data collected in their respective districts.

The Ministry of Water and Environment was specifically responsible for all activities related to planning and coordination at national level, design and production of data collection forms, redesign of the database, progress monitoring, validation and analysis of the collected data, and preparation

of this Water Atlas. The Technical Support Units were instrumental in data validation, submission and follow-up with the districts where required. From the MWE/DWD; the MIS team coordinated the overall implementation of the WATSUP II at the national level. More specifics on the roles and responsibilities during the WATSUP II implementation process are set out in Figure 1: Project Roles and Responsibilities below.

Figure 1: Project Roles and Responsibilities

| Responsibilities of DWOs | |
|--------------------------------------|---|
| 1. | Analysis of existing data |
| 2. | Organizing data collection training and selection of data collectors |
| 3. | Supervising data collection on the ground and progress monitoring |
| 4. | Initial validation and quality assurance of the collected data |
| Responsibilities for Centre and TSUs | |
| 1. | Planning and coordination of the WATSUP II Project |
| 2. | Design and Production of the data collections forms and maps |
| 3. | Technical support to DWOs in planning, training of data collectors |
| 4. | Process and progress monitoring at the national, TSU and district level |
| 5. | Procurement of required hardware, software and re-design of databases |
| 6. | Analysis and final validation of the collected data |
| 7. | Production and dissemination of an up-dated Water Atlas |

5. WATSUP II Implementation

5.1 Design of Data collection tools

The WATSUP II road map started with designing field survey tools and a training programme with the objective of guiding the TSUs, District Water Officers and data collectors in the data collection process and these include;

1. A proposed sample training programme which included instructions on how to conduct the training and the different training modules to cover. This was used by the MIS Staff, TSUs and DWOs in training data collectors.
2. Data collection guideline for the DWO which outlines proposed standard procedures and instructions for collection of data.
3. Field survey handbook for the subcounty data collectors with procedures and instructions for data collection.
4. WATSUP Data collection forms which focused on both district and subcounty level data collection.

District level data collection tools for the DWOs

- A district map
- List of administrative units down to village level to verify administrative units
- Overview list of all piped schemes in the District with a view of updating the missing piped schemes and connections.

- Overview of tap stands and their linkage to respective piped schemes
- Forms for DWOs to capture the system profile for missing piped water supply systems

Subcounty level data collection tools for Subcounty extension staff

- Subcounty map
- List of administrative units down to village level for administrative unit verification
- Forms for update of existing sources. Updating the functionality status, management status of the sources and the actual location of the sources in the database.
- A List with possibly duplicate sources and repetitions per Subcounty as found in the database and needed verification on whether to be removed or kept in the database
- List of Sources with wrong coordinates in the database which had to be corrected.
- Forms to capture point water sources that are missing in the database
- List of rainwater harvesting tanks for reconciliation with the database
- List of likely sources due for decommissioning
- Summary forms signed by each data collector as a commitment to the exercise.

5.2 Data update and WATSUP follow-up activities

District water officers were tasked to identify resource extension staff within their districts to carry out the data update exercise in the respective subcounties. These data collectors had to have adequate Knowledge among others, about the state of the water sources within a given subcounty they represented.

These were taken through training on all the data collection tools (see list above) and also practical field sessions on the use of the GPS units (a mandatory data collection gadget during the update exercise).

While in the field, the data collectors got technical assistance from the MIS team and the TSUs and handled issues that proved peculiar.

After field work, the data collectors submitted the filled data collection tools to the DWO for data verification/initial validation, then the DWO made submission through the TSU to the MIS unit. The MIS unit then sorted the data and made it ready for entry into the WATSUP database.

5.3 Online Atlas and Database

The WATSUP II also involved redesign of the Water Supply



Ministry official taking notes during the data update training exercise in Kisoro

database and website. The previous database had been developed during the WATSUP 2010 as a web-based inventory of water sources. During the WATSUP II, MWE/DWD undertook a major overhaul of the online database to improve its performance and spatial data support. The online Atlas now allows real-time updates. It can be accessed through the MWE website www.mwe.go.ug. The database and website are built based on open source technologies and have been integrated using standard programming practices.

The result of the WATSUP II is that stakeholders are able to access more updated water supply information through this online Atlas and database and it is for this reason that the hardcopy Atlas 2017 is printed as an abridged version unlike the previous Water Supply Atlas 2010.



Ministry officials analysing data at the Ministry headquarters.

5.4 Data entry

In order to ensure quality, the data received from the field was subjected to a series of checks by the MIS team. This data was cleaned, validated, analyzed, and entered into the new water supply database for the production of the atlas. This process was done by different individuals at different levels in the ministry with the aim of;

- a. Validating through QA the draft district specific input to the Atlas prior to publications.
- b. Identifying the errors and gaps in the collected data and therefore rectify them during the data dissemination exercises for those districts with poor quality data. Data that was found to be insufficient was returned to the districts and a new set retrieved.
- c. Providing a common platform for all new water sources for the purpose of harmonizing records at central and local government levels.

6. Challenges faced during the WATSUP exercise

- a. Lack of clear administrative units.
The administrative units in the country keep changing hence posing a challenge to the exercise
- b. Few GPS machines which affected data collecting programme since participants had to share among themselves.

7. Water Supply Database content

The WATSUP database serves as the major pillar of the Water and Sanitation Sub-sector Management Information System (WSS-MIS). Most information contained in the Atlas has been generated from the WATSUP database. This database has many more informative reports such as annual reports, trend analysis and real-time report. These reports are also presented as tables, graphs, charts and maps. This Atlas also contains extracts from the database such as tabular reports, graphs, charts and maps.

8. Water for Production

This Atlas also contains information from the Department of Water for Production. This information is stored on the Water for Production database - a custom designed web-based database housed on the MWE servers for the DWFP. This information covers all WfP facilities in Uganda constructed by the government of Uganda, Non-Government Organisations and the private sector. These facilities include Earth Dams and Valley Tanks.

9. Utility Performance Monitoring & Information System

The Atlas also contains piped scheme information from the Utility Performance Monitoring and Information System (UPMIS). This is a newly developed web-based system that is majorly used by the Department of Urban Water and Sewerage under MWE-DWD. The UPMIS database contains information on all piped schemes under the oversight of the Directorate of Water Development, Ministry of Water and Environment as well as NWSC.



A practical GPS training session in Nakasongola district

10. Disclaimer

This Atlas has been produced basing on administrative units received from UBOS and also using population figures from the National Population and Housing Census 2014 commonly referred to as "UBOS Census 2014". However since then some of the changes in the administrative units such as the new districts created after June 2016, have taken place which will not be reflected in this atlas. In addition this atlas uses UBOS shapefiles of 2014 and 2010.² The MWE has made all efforts to ensure that the raw data used for the WATSUP database is of the highest possible quality to produce a commensurate quality Atlas. For certain outputs with limitations, explanatory notes have been provided.



Data entry activity in the Water Supply Database

² District and Subcounty shapefiles were prepared and provided by UBOS in 2016. They reflect the status of 2014. The Parish shapefiles are of 2010.

EXPLANATORY NOTES

1. Information Presented in this Atlas

The Uganda Water Supply Atlas 2017 has been prepared using water supply data from 111 districts (as of financial year 2015/2016²) and areas covered by NWSC. This information is a result of data collected and processed through the Water Supply Database, UPMIS database and WfP Database. The processed data has been presented as maps, charts, tables, and figures and compiled into this Atlas.

2. Sources of Information

The information on point water sources and piped water supplies presented in this Atlas are a result of an update exercise carried out by the Ministry of Water and Environment in 2015/2016 and 2016/2017. This however is with exception of the information on piped water supply systems in areas managed by the National Water and Sewerage Corporation (NWSC), which has been obtained directly from NWSC.

3. Administrative Units and Population Figures

The population statistics and breakdown of administrative units from district down to sub-county have been obtained from the Uganda Bureau of Statistics (UBOS) as well as the GIS layers used.

The population statistics are from UBOS Census 2014 and have been projected to June 2017 based on the district population growth rates published in the UBOS Census 2014. It is assumed that the district growth rates are the same for the subcounties within the district. These subcounty projected population figures are then added up to give the district population and in turn the national population.

4. Distinction between rural and urban areas

The water and sanitation sub-sector follows the official UBOS distinction between the urban and rural areas. Urban areas in Uganda include one City Council (Kampala), 33 Municipalities and 163 Town Councils as of financial year 2014/2015.

The database has provision to compute indicators for urban and rural separately from sub-county up to district level. However the database provides for a combined approach as well. It is from the Water Supply database that these indicators are obtained.

² All new districts created after financial year 2015/2016 are catered for in their original districts of origin.

5. Definition and Scope of improved water supplies

In the Ugandan context, improved water supply sources include; protected springs, shallow wells, deep boreholes, rainwater harvest tanks, ground water schemes, surface water schemes as well as combined ground and surface water schemes. Only sources and scheme with safe water for human consumption have been used in computing the major five indicators; however earth dams and valley tanks which are under WfP department are used only in computation for WfP indicators.

5.1 Point water sources

These typically comprise; protected springs, shallow wells, deep boreholes, rainwater harvesting tanks and tap stands (Yard Taps for Public use, Kiosks and Public Stand Posts). This data is captured using the form one: Point water source form (See Annex 1a: Data Collection Form 1 - Point Water Sources). These water sources appear in the plot maps of the subsequent pages. In addition to this, point water sources in urban areas, except those in areas served by NWSC, have been mapped and included in the database.

5.2 Piped water supplies/schemes

These are piped water supply comprising Surface Water, Ground Water and Combined Surface and Ground water based schemes. These

piped systems are majorly in urban areas and cover some rural areas. In this atlas, sub-section "Piped Water Schemes" under section "National Reports" has been dedicated to detailing the information concerning piped water supply/scheme in Uganda.

5.3 NWSC piped supply

The National Water and Sewerage Corporation (NWSC) is a government parastatal under the Ministry of Water and Environment that operates and manages water and sewerage services in 170 service areas ("Areas") located across the country. These cover the capital city and surrounding areas as well as 15 Municipalities around the country namely; Arua, Lira, Gulu, Soroti, Mbale, Tororo, Jinja, Mukono, Masaka, Fort Portal, Hoima, Masindi, Mbarara, Kabale and Kasese. Until recently more Municipalities have been taken over by NWSC however by the time of publishing this Atlas NWSC had not yet updated the information in these areas. Nonetheless NWSC piped water systems are found in 62 districts cover-

National Population and Housing Census 2014
The total population of Uganda in 2014 was 34,634,650 with a growth rate of 3.0%. With this growth rate Uganda's total population is an estimated 37.9 million in 2017. According to UBOS, "in March 2016, there were 259 urban centres in Uganda". These included "one capital city, 33 Municipalities, 163 Town Councils and 62 Town Boards".

ing 400 sub-counties as of June 2016. This atlas dedicates a sub-section called “National Water and Sewerage Corporation” under “National Reports” section to illustrate the NWSC efforts in contributing to water supply in Uganda. In many Areas, NWSC piped systems also supply water to adjacent rural populations. The information on the outlets in the rural areas has been included in the Atlas.

5.4 Water for Production

These are earth dams and valley tanks from the whole of Uganda either constructed by the government of Uganda, Non-Government Organisations and the private sector. However these water sources are not considered safe for human consumption but rather for agricultural purposes such as animal husbandry and crop farming. This atlas dedicates sub-section “Water for Production” under “National Reports” to Water for Production information.

5.5. Abandoned sources

The database inventory includes all water sources irrespective of the functionality status and how long they have been out of service. In light of this, all water sources that have been non-functional for more than 5 years are assumed to be “abandoned”. As such these sources have not been used in any computations. Within the national and district reports of this Atlas, the accompanying narratives will give the total number of these “abandoned” sources.



Abandoned water source in Masindi District.

Further to this sources that have been proved to be irreparable are decommissioned. This is a process that requires verification from both the authorised DWOs and MWE officials.

6. Indicator definitions

All indicators referred to in this Atlas are based on the agreed golden indicators as defined in the Sector Performance Measurement Framework, established by the MWE in 2004. Five golden indicators, namely Access, Functionality, Equity, Management and Gender have been assessed and reported on in this Atlas. Box 1: Provides a definition for each indicator.

Box 1: Golden Indicators

| | |
|----------------------------|---|
| Access ³ | Percentage of people within 1 km (rural) and 0.2 km (urban) of an improved water source. i.e. within walking distance ⁴ |
| Functionality ⁵ | Rural Water Supply: Percentage of improved water sources that are functional at the time of spot-check. Urban Water Supply: (excluding areas managed by NWSC); Percentage of public safe water outlets that are functional at the time of spot-check. NWSC served areas: Percentage of active connections; WfP: see page 29 |
| Equity ⁶ | District Level: Mean sub-county deviation from the district average number of persons per improved water point. National Level: Mean sub-county deviation from the average persons per improved water point. |
| Management ⁷ | Percentage of communally managed functioning water sources with active Water & Sanitation Committees. |
| Gender ⁷ | Percentage of Water & Sanitation Committees with at least one woman holding a key position. |

7. Formulas

This section describes the formulas used to derive the five golden indicators used in the Atlas. The abbreviations used in the formulas are listed in Box 2.

Box 2: Abbreviation for water sources

| | |
|-----|----------------------------|
| PS | Protected Springs |
| SW | Shallow Wells |
| DBH | Deep Boreholes |
| RHT | Rainwater Harvesting Tanks |
| DAM | Dams |
| VT | Valley Tanks |
| PSP | Public Stand Posts |
| KSK | Kiosks |
| YT | Yard Taps |
| F | Functional |
| NF | Non-functional |
| AVG | Average |

³ Access is disaggregated as rural, urban or/and total as well as presented at the National, District and Sub-county level.

⁴ Walking distance is not measured per se but is incorporated in the proximate figure used to specify estimated number of people served per technology.

⁵ Functionality is presented as rural functionality and urban functionality. Rural and Urban functionality are based on domestic safe water supply only. All functionality figures are presented at national, district and sub-county level.

⁶ Equity is calculated based on improved water sources in rural areas only (hence WfP facilities and presented at national and district level only).

⁷ Management and Gender indicators are calculated based on communally managed functional and in-use water sources. The only water sources included are protected springs, shallow wells and deep boreholes.

7.1 Access

Access to safe water is the percentage of people within 1 km (rural) and 0.2 km (urban) of an improved water source. The calculation is based on the estimated number of people served per each type of water source. This number is then multiplied by the total number of that source type existing in a particular area to get the total number of people served in that area. The source of information (Form 1, Form 2 or NWSC) for the number of sources used in the formulas are listed in Box 3.

Box 3: Number of users per water type

| Point Water Sources ⁸ |
|---|
| <ul style="list-style-type: none"> Protected springs: 200 users (Form 1) Shallow wells: 300 users (Form 1) Deep boreholes: 300 users (Form 1) Rainwater harvesting tanks >10,000 liters: 6 users (Form 1) Rainwater harvesting tanks <10,000 liters: 3 users (Form 1) |
| Piped Water Supply |
| <ul style="list-style-type: none"> Public Stand Post/Kiosks: 150 users (Form 1) Yard taps for public use: 150 users (Form 1) Yard taps for private use: 24 users (Form 2) House connections: 6 users (Form 2) Institutional connections: 100 users (Form 2) Public Stand Pipe (NWSC urban)⁹: 200 Institutional connection (NWSC urban): between 100 and 1,000 depending on the size of the Municipality Council/Town Council served |

Calculations are undertaken at sub-county level, with the final step of the calculation process involving an adjustment or a “capping” of the figures to ensure that improved water sources in a particular sub-county do not serve more than 95% of the population. The capping is done to avoid unrealistically high coverage figures at district level.

$$A = \frac{\text{total number of people served by point and piped water supplies}}{\text{total population}}$$

7.2 Functionality

Functionality is the number of functioning improved water sources divided by the total number of improved water sources. Functional water sources are those found operational and able to produce water at the time of the spot check. Sources which are Functional (not in use) are considered as functional if the downtime is less than 5 years or not specified. Sources not operating for 5 or more years are assumed to be abandoned, and hence are not included in the calculation. Functionality (F) is calculated as:

$$F = \frac{\text{Functional (PS + SW + DBH + RHT + PSP + KSK + YT)}}{\text{Total (PS + SW + DBH + RHT + PSP + KSK + YT)}} \times 100$$

The Functionality for Water for Production facilities (Dams and Valley tanks) is calculated as:

$$F(WfP) = \frac{\text{Sum of Functional (DAM + VT)}}{\text{Total (DAM + VT)}} \times 100$$

NWSC uses the ratio between active and inactive connections to determine functionality. Hence functionality for NWSC is calculated as:

$$F(NWSC) = \frac{\text{Active connections}}{\text{Total connections}} \times 100$$

7.3 Equity

The Equity (E) indicator helps to determine the deviation between the number of persons per improved water point at the district and sub-county levels. The higher the numerical value the greater the inequity while a lower numerical value indicates a better equity. Equity determinations were only done for improved water sources in rural areas.

Equity Indicators is calculated using the following steps:

| | |
|--------|---|
| Step 1 | District average: divide district rural population by total number of improved water sources in the district |
| Step 2 | Sub-county average: for each sub-county divide the number of rural people per improved water source by the total number of improved water sources in the sub-county |
| Step 3 | Calculate the difference between the district average and the sub-county average for each sub-county |
| Step 4 | Calculate the absolute value of the difference obtained in step 3. |
| Step 5 | National Level – Add up the absolute values and divide it by the number of sub-counties |

7.4 Management

The management (M) indicator gives the ratio of communally managed water sources in rural areas with a functioning Water Source Committee to those with any Water Source Committee. A Water Source Committee is defined to be functional if it at least it collects fees or undertakes repairs or holds meetings around the source. This data is collected through Form 1¹⁰.

$$M = \frac{\text{total number water sources with functional WSC}}{\text{total number of water sources communally managed}} \times 100$$

Only protected springs, boreholes and shallow wells in rural areas are considered and only if they are functional and in use.

7.5 Gender

The gender (G) indicator gives the ratio of Water Source Committees with at least one woman in a key position versus the total number of functional Water Source Committees. A Water Source Committee is defined to be functional if it at least collects fees or undertakes repairs or holds meetings. It only considers functional and communally managed sources in rural areas.

¹⁰ All records of communally managed sources with information filled in the fields 5.2 to 5.9 on Form 1 (Annex 1a) are considered for the denominator.

⁸ In both rural and urban areas

⁹ For NWSC PSPs in rural areas 150 people per PSP are used

$$G = \frac{\text{total WSCs with at least one woman in a key position}}{\text{total no. of WSCs established}} \times 100$$

8. Presentation of the Atlas

This Atlas presents the information in five categories namely Chapter 1: Introduction; Chapter 2: Explanatory Notes; Chapter 3: National Reports; Chapter 4: District Reports; Chapter 5: Point Maps; and Annexes.

8.1 Chapter 1: Introduction

This section is simply an introduction about the genesis of the Atlas, sources of the information it contains, the intended beneficiaries, and the purpose of the atlas.

8.2 Chapter 2: Explanatory Notes

This section goes deeper into explaining the key components and processes that together lead to the production of this atlas. These entails the definitions of the indicators, the processes that were used to obtain information, the formulae for calculating the indicators and the challenges encountered.

8.3 Chapter 3: National Reports

This chapter contains national information presented as maps, charts, boxes, figures and tables. The information here is on WfP, NWSC, Piped and Scheme Supply. The point water source information is also aggregated at national or district levels.

8.4 Chapter 4: District Reports

This chapter contains district information presented as charts, boxes, figures and tables. The districts are presented in alphabetical order. In this chapter each district is presented on one page. This page includes an introductory narrative giving a summary of the water supply situation in that district, boxes highlighting the five key indicators, several maps, bar charts and pie charts as explained in section 9.

8.5 Chapter 5: Atlas

This chapter includes several pages of plot maps showing point water sources.

8.6 Annexes

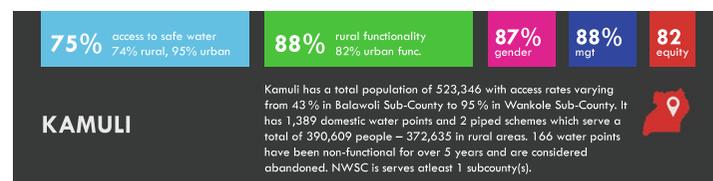
This section contains various extracts from the systems as well as tools used in producing this atlas. These include the data entry tools used in data collection and administrative unit lists used the data sets.

9. Presentation of charts, maps and tables in the Atlas.

Several standard maps, charts, tables and figures are used in the National Report and District Report. In addition to this, standard naming conventions will be applied to all maps, charts, boxes and tables both within the national reports and district reports.

District indicators (in colored boxes)

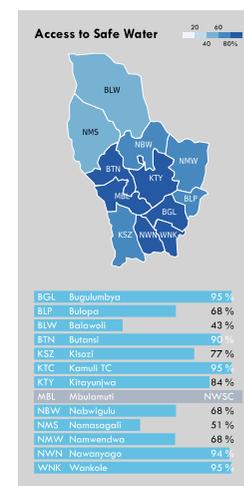
Each district page starts with several colored boxes that each represent a particular indicator at district level. Starting from left to right these are:



- Blue Box with Access indicator figure. Access has also got a rural access and urban access sub-indicator.
- Green box with Functionality indicator figure. Functionality is calculated and presented as rural functionality and urban functionality.
- Hot-Pink box with Gender indicator figure.
- Purple box with Management indicator figure.
- Orange box with Equity indicator figure

Access to Safe Water

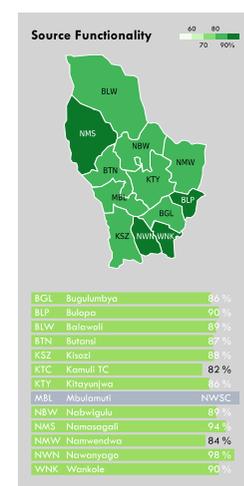
This shows a shade map and bar chart for access at both district and sub-county level. The access here is a combined rural and urban access.



However areas gazetted under NWSC are depicted in gray with a “NWSC” label in place of the actual access figure. This is because NWSC computes access using area blocks which stretch beyond several administrative areas hence having one indicator figure for a cluster of administrative areas.

Source Functionality

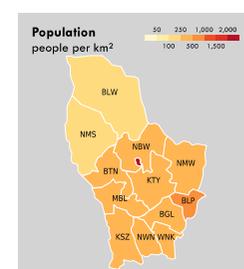
This shows a shade map and bar chart for functionality status at both district and sub-county level. The functionality here is separated into rural and urban functionality.



However areas gazetted under NWSC are depicted in gray with a “NWSC” label in place of the actual functionality figure. This is because NWSC computes functionality using area blocks while the other areas covered by DWD are calculated basing on local government administrative units.

Population density

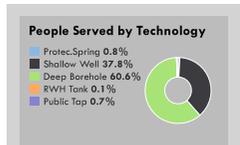
This shows a shade map of the population density at both district and sub-county level. The population density is computed for each administrative unit.



It depicts the number of persons per km². The population density is based on the populated surface area only and excludes national parks and water bodies.

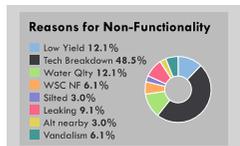
People served by technology

This is a pie chart is presented at both national level and subcounty level and shows the people served by each technology. For instance 50% indicated on Deep boreholes means that 60% of the population in the given area have access to safe water which is got from deep boreholes.



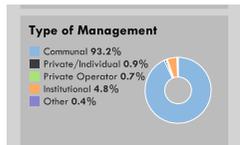
Reasons for Non-functionality

This is a pie chart presented at both national level and subcounty level and shows both the main reasons for non-functionality and their main respective importance. The data collection forms allow for more than one reason to be given and they are taken into consideration in the chart. Water sources that have not been active for more than 5 years are not included in these charts. The categories of reasons for non-functionality include: dry/low yielding, technical breakdown, water quality, WSC not functioning, silted, leaking, alternative source nearby and vandalism.



Type of Management

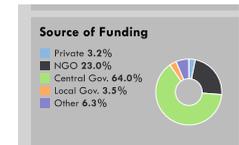
This is a pie chart is presented at both national level and subcounty level and shows the type of management for improved water sources (excluding house connections, institutional connections and WfP facilities).



The types of categories include: communal, private/individual, institutional, private operator or other. For instance 60% indicated on Communal means that 60% of the point water sources in the area are managed by the community.

Source of funding

This is a pie chart presented at both national level and subcounty level and shows the type of source of funding for improved water sources including public piped outlets. The five categories include: private, NGO, GoU (central), GoU (Local) and Other. For instance 30% indicated on NGO means that 30% of the point water sources in the area were constructed or rehabilitated with funds from an NGO.



District level trend analysis

This is a bar chart presented at district level showing the performance trend of the district over the years (starting with financial year 2009 to 2016). The key indicators in track include Rural Access, Urban Access, Access (Rural and Urban combined), Rural functionality and Urban functionality.

