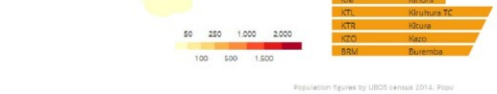

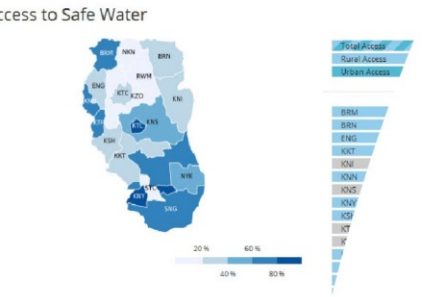

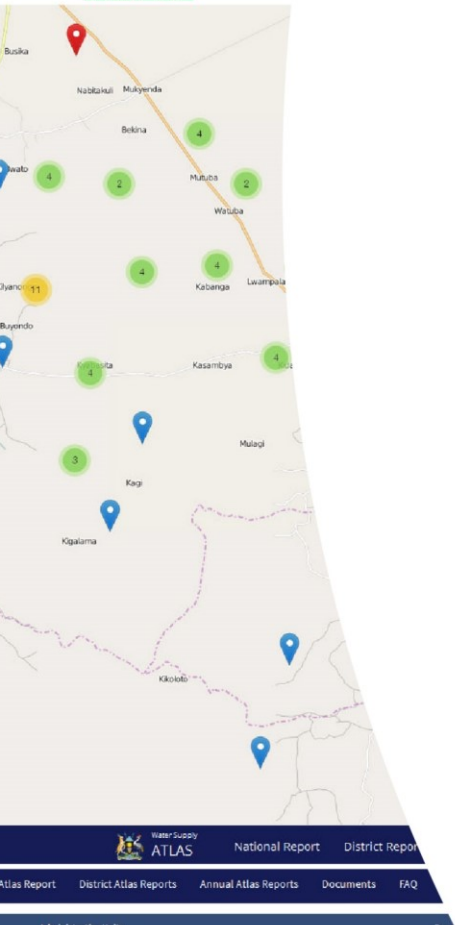

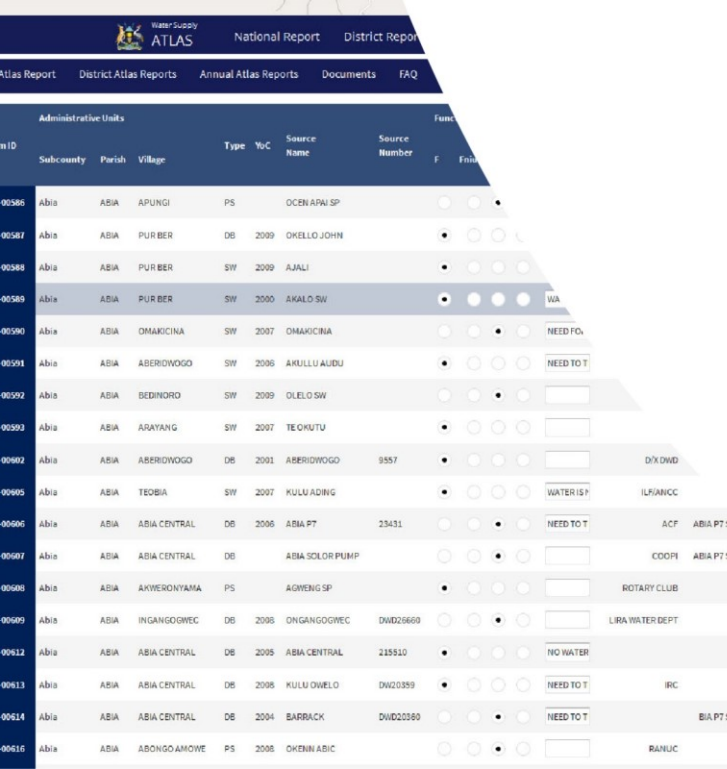

THE REPUBLIC OF UGANDA

Ministry of Water and Environment

Directorate of Water Development

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Documentation of key indicator calculations

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List of Abbreviations

DBH: Deep Borehole
Fniu: Functional (not in use)
GFS: Gravity Flow Scheme
GWS: Groundwater pumped scheme
HC: House connection
IC: Institutional Connection
KSK: Kiosk
MC: Municipality
PS: Protected Spring
PSP: Public Stand Post
RHT: Rainwater Harvesting Tank
SC: Sub County
SW: Shallow Well
SWS: Surface Water Scheme
TC: Town Council
UBOS: Uganda Bureau of Statistics
VT: Valley Tank
WfP: Water for Production
YT: Yard Tap

1 General remarks

1.1 New vs. old sub counties

Reports and calculations are made for the new sub counties (SC). However for the time of the assessment not all sources have been moved to their new sub county. This leads to missing values in new sub counties and very high/low figures in the mother sub counties.

1.2 Rural vs. urban

The differentiation between urban and rural is made on sub county level. A sub county is either marked as urban or as rural. Depending on this attribute sources of that sub county are either counted for the urban or rural calculation.

Urban sub counties are sub counties which are a TC, part of a TC or divisions/sub-counties in MC.

1.3 Downtime and Functionality

Downtime is the period in years for which a source has been Non-functional or Functional but not in use. (See Figure 1: Driving 'Downtime' from Form 1)

Sources with a downtime of more than 5 years are not considered in calculations. The downtime is calculated on-the-fly based on the current date and the date of breakdown.

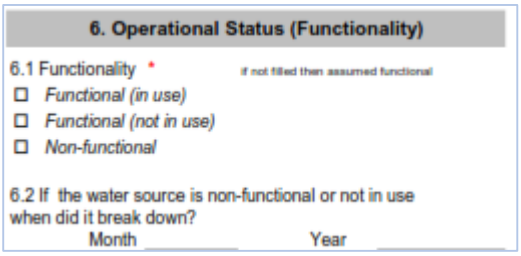

Figure 1: Driving 'Downtime' from Form 1

1.4 Improved Water Supply Sources

Improved water supply sources include protected springs (PS), shallow wells (SW), deep boreholes (DBH), rainwater harvesting tanks (RHT), surface water schemes (SWS) and ground water pumped schemes (GWS) as well as Combined Ground and Surface Water Schemes. Improved piped water supply outlets include public stand posts (PSP), yard taps (YT), kiosks (KSK), house (domestic) connections (HC) and institutional connections (IC). WfP facilities (dams and valley tanks (VT)) are consequently not regarded as improved water supplies for domestic use however the Water Supply Database has same records on them.

1.5 Population figures

Population figures are taken from the provisional results of the UBOS 2014 census at sub county level.

2 Access

2.1 Way of calculation

Access is calculated for improved water sources (no dams and no valley tanks considered).

The calculation is based on the estimated number of people served per each type of water source, as listed in Table 1. 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 access rate is the ratio of the total number of served people from the total population.

Table 1. Number of users per water source type

Water source type	Abbreviation	Number of users
Protected Spring	PS	200
Shallow Well	SW	300
Deep Borehole	DBH	300
Kiosk	KSK	150
Rainwater Harvesting Tank <10,000 l	RHT	3
Rainwater Harvesting Tank >10,000 l	RHT	6
House connection	HC	6
Institutional connection	IC	100
Yard tap for public use (point water source/Form1)	YTF1	150
Yard tap for private use (scheme/Form2)	YTF2	24

Because yard taps are collected as point water sources/public use in Form 1 (YTF1) and in piped schemes/private use in Form 2 (YTF2) a correction factor is included. In a first step all Form 1-Yard taps are considered. In a second step only those Form 2-Yard taps are added, which have not yet been included before.

A capping is implemented at sub county and district level returning 95 % access in cases where the access is >95 %. The population served for the entire district is calculated based on the capped percentage.

2.2 Formula

1. Calculate the number of people served at sub-county level by multiplying the number of sources per type with the number of users given for each type in Table 1.
    a. For Point water Sources

$$PopPWS = PS * 200 + SW * 300 + DBH * 300 + KSK * 150 + YTF1 * 150 + RHTsmall * 3 + RHTbig * 6$$

    b. For Piped Schemes

$$PopPS = HC * 6 + IC * 100 + (YTF2 - YTF1) * 24$$

    c. For NWSC served areas a total population served figure is provided from NWSC on district level (PopServedNWSC) and only added there.
2. Calculate the total number of people served

$$total\ served = PopPWS + PopPS$$

3. Divide the number of served people by the total population. The result is maximal 0.95, thus capped if applicable:

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

4. On district level the capped sub county access is used. The result is maximal 0.95, thus capped if applicable:

$$Access\ District = \frac{sum(SC\ population) * Access\ SC + PopServedNWSC}{sum(SC\ population)}$$

2.3 Remarks

- Functional, functional (not-in-use) and non-functional sources are considered. Decommissioned sources are not considered. Sources with a downtime of >5 years are not counted neither.
- The district access is additionally capped if higher than 95 %. The population served per district is recalculated with the capped value. This can result in lower national population served.

2.4 To do

- NWSC is not yet included on SC level.
- National Water Coverage is not yet included in Kampala/Mukono/*Wakiso* and *Soroti/Kaberamaido/Amuria*. This leads to wrong coverage values in urban sub counties and low coverage values in districts.

3 Functionality

3.1 Way of calculation

Functionality is the number of functioning improved water sources divided by the total number of improved water sources. Only point water sources are considered (all beside of dams or valley tanks). A separate WfP Functionality is calculated considering dams and valley tanks only.

On district level the calculation is done twice counting sources from urban and rural sub counties separately. With this method a rural and an urban functionality is calculated.

3.2 Formula

1. count all functional PWS
2. count all PWS
3. calculate ratio

$$Functionality = \frac{Sum\ of\ functional\ point\ water\ sources}{sum\ of\ functional + sum\ of\ non\ functional\ pws}$$

3.3 Remarks

- Sources marked as "Functional (not in use)" (Fniu) are considered as functional if the downtime is less than 5 years or not specified.
- Sources marked as "recommended for decommissioning or decommissioned" are not included in the calculation

3.4 To do

- nothing

4 Equity

4.1 Way of calculation

Equity determines the deviation between the number of people per improved water point at sub county level.

Therefore, the sub county and district population is divided by the number of sources in that sub-county and district respectively. The equity is then the difference between the district and sub county ratios.

National and district equity are also based on sub county level and give the average of considered sub-counties.

4.2 Formula

- count all point water sources per rural SC
- count all point water sources in rural SC per district
- count all population of rural SC per district
- calculate sub county equity

$$Equity\ SC = \left| \frac{rPopDistrict}{sum\ of\ district\ PWS} - \frac{PopSC}{sum\ of\ SC\ PWS} \right|$$

- calculate district equity

$$Equity\ district = \frac{sum\ of\ all\ district's\ sub\ county\ equities}{total\ rural\ sub\ counties\ in\ the\ district}$$

- calculate national equity

$$Equity\ national = \frac{sum\ of\ all\ sub\ county\ equities}{total\ rural\ sub\ counties}$$

4.3 Remarks

- Only rural sub counties are considered, hence population and point water sources are only counted from those sub-counties.
- Sub counties with only one or two sources are not considered
- Dams and Valley tanks are not considered.
- District equity is <u>not</u> calculated as the difference from district average to national ratios

$$Equity\ District = \left| \frac{rPopNational}{sum\ of\ national\ PWS} - \frac{rPopDistrict}{sum\ of\ District\ PWS} \right|$$

  District Equity is the simple average of SC equity figures.

4.4 To do

- nothing

5 Management

5.1 Way of calculation

The management indicator gives the percentage of communally managed water sources (PS, SW, DBH) in rural areas with a functioning Water Source Committee (WSC).

5.2 Formula

1. count all springs, boreholes and shallow wells which are
    a. functional
    b. in a rural SC
    c. communally managed
    d. and where a WSC is established
2. of those sources count the ones which have a functioning WSC (the WSC collects fees or undertakes repairs or holds meetings or cleans environment/sanitation around the source)
3. calculate the ratio

$$Management = \frac{total\ communally\ managed\ sources\ with\ a\ functioning\ WSC}{total\ communally\ managed\ sources\ with\ established\ WSC}$$

5.3 Remarks

- Only springs, boreholes and shallow wells are considered. RHT, PSP, KSK and YTF1 were taken out in 2013 calculation.
- Only functional (in use) sources are considered
- Only rural sub counties are considered
- Only communally managed sources are considered
- Only sources with a WSC are considered. In 2010 atlas all communally managed sources were considered.
- A WSC is considered functional only if the WSC collect fees or undertake repairs or hold meeting or there is a clean environment/sanitation around the source. In 2015, the option of a "clean environment/sanitation around the source" was added to for considering a WSC functional.
- The Type of Management chart in the atlas also include non-functional sources, only decommissioned sources are not included. The Management chart is not the same as the Management indicator.

5.4 To do

- nothing

6 Gender

6.1 Way of calculation

The gender indicator is restricted to communally managed water sources in rural areas and gives the ratio of WSCs with at least one woman in a key position versus the total number of functional WSCs in the same area

6.2 Formula

1. count all springs, boreholes and shallow wells which are
    a. functional
    b. in a rural SC
    c. communally managed
    d. and where a WSC is functional
2. of those sources count the ones which have a women in a key position of the WSC
3. calculate the ratio

$$Gender = \frac{total\ communally\ managed\ sources\ with\ a\ woman\ in\ a\ key\ position}{total\ communally\ managed\ sources\ with\ a\ functional\ WSC}$$

6.3 Remarks

- Only Functional (in use) water sources are considered.
- Gender was calculated from sources with any established WSC in 2010. This was changed in 2013 to be calculated from sources with functioning WSC only. Both gender indicators are calculated in the database.
- Functional WSC are source where user fees are collected or repairs are undertaken or meetings are held. This was changed in 2015 to also consider WSC as functional if they clean the environment/sanitation around the source only.

6.4 To do

- nothing

7 Changes of calculation methods over time

Over time districts, sub counties and sources of population figures changed which make the comparison between key indicators of different years difficult. Additionally any calculation only reflects the status of the database by that time and not the status of water sources in that region by that time. With new data collections older sources have been added and might have changed even past key indicators.

Furthermore changes in the calculation of the key indicators have been made. Table 2 shows the changes for the last years.

Table 2. Changes on key indicator calculations over time

Key indicator	2010	2011	2012	2013	2014	2015
Access						- Decommissioned sources are not considered (this attribute has not existed before)
Functionality						
Equity	All PWS beside of dams and VT are considered					
Management	Ratio from all communally managed sources			- PS, DBH and SW only - Ratio from communally managed sources with a WSC only		WSC which perform environment only are also considered as functional WSC
Gender	Ratio from communally managed sources with any WSC			-only function in-use PS, DBH and SW - Ratio from communally managed sources with a functional WSC only		