

WCARO output 2

How to visualise SDG 6

?

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Introduction

[JMP](#) is an initiative to streamline the methodology for determining SDG 6 contributions. By following this methodology ministries, NGOs and other organisations work towards a situation where SDG 6 contribution can be compared efficiently and robustly. This will help in determining SDG progress around the world.

Now that program design and data collection are getting more and more streamlined, we see a need for streamlining data representation. Data analysis and visualisation is a powerful tool for presenting data and creating insights, however using it well requires expertise. Developing a standardized methodology for analysing and visualising JMP and water point data will have three effects on the process of presenting the data: it will be more robust, more efficient and easier to interpret for the user. By having a tested methodology the analysis will be more robust. By having the methodology as a ready to use tool, the process will be more efficient. And finally, when all JMP related dashboards / portals / websites represent the results in the same way, it will be more easily understood by users of such tools.

Methodology

When designing a water portal it is important to first consider the goal of the portal. WaSH portals can for example be used for planning purposes of a WaSH ministry, where country WaSH data is analysed, compared and aggregated in order to determine how to best use that years' budget. Another goal of a WaSH portal can be local maintenance of water sources or sanitation services, where data is visualised, frequently updated and used for concrete and timely action.

When the goal of the portal is clearly formulated and agreed upon with all involved stakeholders it is important to assess whether the available resources fit the goal. Relevant considerations to make are:

- **The available data sources.** Indicate whether the available data will give you the insight you need. Then assess whether the data is of high enough quality to draw conclusions from. Important aspects are the accuracy, completeness, consistency, timeliness, validity and uniqueness of the data. Finally, assess whether there are enough resources, both in capacity and time, to update the data when/if needed.
- **The technical resources.** Either for building a new tool or designing an existing tool. Think about front-end development, back-end development, UX design and data visualisation.
- **The financial resources.** For keeping the portal running for the anticipated time. This includes the cost for maintenance.

In order to make a portal easy to use it can be helpful to define a storyline. A storyline can help arrange the information on the portal in a way that it is easy to read and understand. When defining such a storyline, one can start with the user: What is the user looking for? Does the user need theoretical information or are they experienced in WaSH? Is the user interested in a country level overview or are they only interested in local information? Does the user need to take action after going to the portal? If so, what does the user need to get to action?

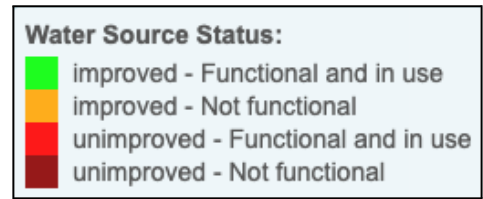
Step 1: Visualise Water Coverage

Many WaSH ministries have water point mapping data available, usually for planning and maintenance purposes. This data can be used to determine the general water coverage of a country. It has information about the amount of water points, the type of water points, the location and in some cases the functionality of the water point and the quality of the water. By comparing the coverage of the water point with the water needs of a country, basic water shortage can be determined.

Important aspects when determining water coverage are the water point status and the functionality. Water point status is defined by Unicef and WHO as improved or unimproved. Only improved water

points have the infrastructure that is likely to supply good quality water. In order for household water supply to be classified as *basic* following the JMP service levels the water has to be retrieved from an improved source.

In the figure (1) below you can see a collection of water points in a district. The green marked water points were improved and functional at time of data collection, the yellow points were improved but not functional, the orange points were unimproved and functional and finally the red water points were unimproved and not functional.



Legend enlarged

This graph allows for a quick overview of the current water points and their status and therefore allows for a quick assessment of areas that need immediate attention due to a large amount of unimproved and/or not functional water points. In the case of the figure below the western and middle area seem to have a large amount of unimproved sources, indicated with the circles. Between the middle and the western area, indicated with the arrow, there hardly seem to be any water points. This *could* mean that there is an area where the population is largely underserved. However, in order to determine whether that is the case, we need to know if there are people currently living in that area. In the next section population density data will be added to the map.

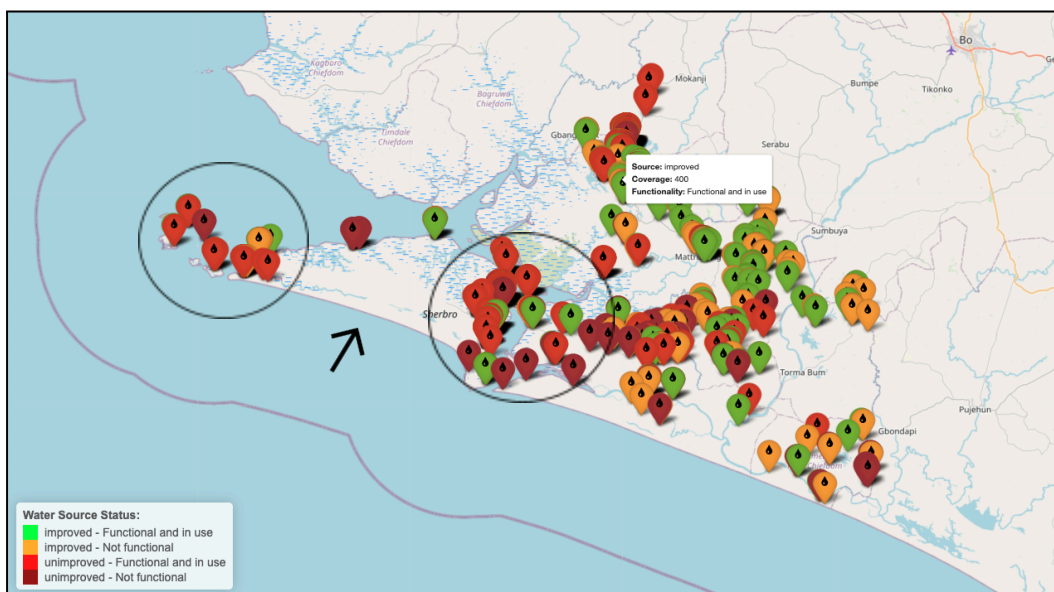


Figure 1: Overview of water point with indication of the water point status and functionality at time of data collection. The colored markers represent the different water points, the colors indicate the status and functionality (see legend).

Step 2: Visualize Population data

Population data is a vital enrichment of water point data, as it can be used to determine if parts of the population are underserved, and where. When only considering water point data you can't draw conclusions about the actual water coverage of an area. Whether an improved source serves the people it can serve or a non functional water point is actually leaving people unserved can only be determined when considering the population living near to, and far from, the water points.

The figure below (2) shows the same overview of water points overlaid with population density data. The colored markers again represent the water points and the blue dots represent the population. Every dot on the map represents an estimated group of people, with an average of 16 people per dot. The area identified above as having little to no water points, indicated by the arrow, seems to have a population that is now unserved. Another indicator that there are people living without access to a water point, is that the population seems to be gathered around natural water sources.

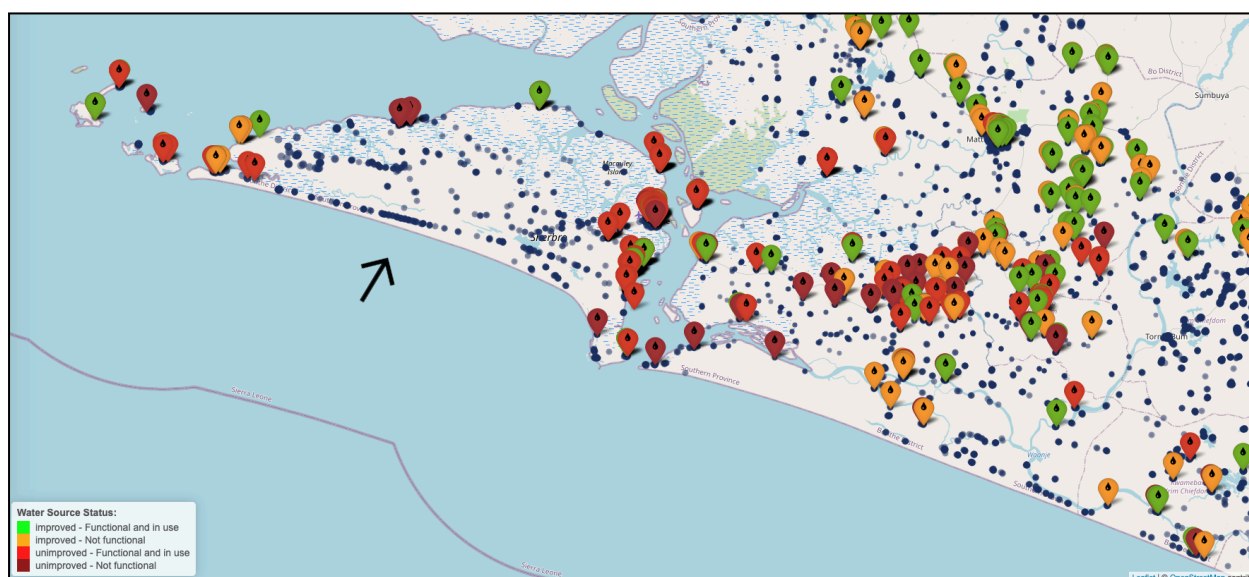


Figure 2: Overview of water points with indication of the water point status and functionality at time of data collection, overlaid with population density data. The colored markers represent the water points and the dark blue dots the population. Every dot on the map represents an estimated group of people, with an average of 16 people per dot.

One of the essential parameters that can be determined when combining the water point data with population data is *per capita access*. Per capita access is the amount of people per available improved and functional water point in the area. When 10,000 people need to share 25 water points, the per capita access is 400. This number can be compared with the (average) capacity of the water points to determine whether the amount of water points is enough to serve the population in the area. Water point capacity is information that usually can be retrieved from the WaSH ministry of a country and is usually determined per water point type.

Step 3: Visualize Household data

In order to determine the JMP service levels at the household, household level data is necessary. Estimates¹ of the JMP service levels of a household can be made with proxy data however it can never tell the whole story. Water quality is especially an indicator that can be influenced by the household. Water transport to a home and water storage at home can influence the water quality. Household level data is therefore crucial in determining the water service level of a household.

Household WaSH data can be used to create different insights. How many people report depending on unimproved sources for drinking water? How many people report having to walk more than 30 minutes to collect clean water? When combining this with water point and population data you can combine different insights and use that to zoom in on the root cause of low water service levels. For example, is the water quality low at the household only, or at the household and at the source? Are the households that report getting their water from an improved source indeed living near an improved source?

The figure below (3) shows the water point data from before. This time the color of the markers distinguishes the improved from the unimproved sources and the marker icons show whether a water point was functional during data collection. The blue and orange color resemble the blue and orange from the JMP ladder. The different communities are also colored blue or orange. In a blue community the majority of the households report having drinking water of a basic service level. In an orange community the majority of the households report having drinking water of an unimproved service level. By overlaying the aggregated household services levels with the water points we can make a first assessment of the possible source of unimproved water service levels of households.

¹ See output 1: estimating water service levels without household data



Figure 3: Aggregated household water service level overlaid with waterpoint data.

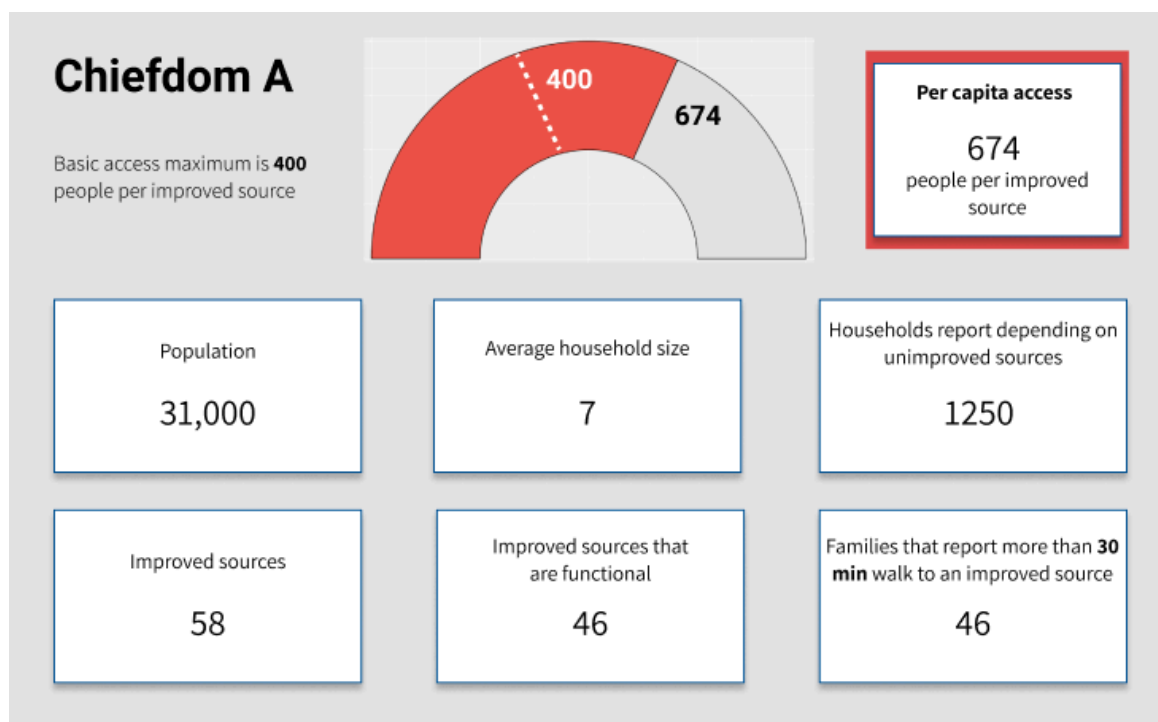
From here, we can zoom in on a specific district and use the water point and household data to extract insights. The overview below (1) is an example of statistics of a fictional district. These key statistics indicate the levels of vulnerability in a chiefdom and can be used to determine what is needed to give all the households a basic water service level.

Per capita access: is the amount of people per available improved and functional water point in the Chiefdom. In this case 31,000 people need to share 46 water points, which makes the per capita access 674. This number can be compared with the capacity of a water point, which in the example is 400. The half-moon chart in the top middle of the overview shows that the per capita access is too high compared to the capacity of the water points, which means that people in the Chiefdom are underserved.

Population: the amount of people living in Chiefdom A.

Improved sources: The number of improved water points in Chiefdom A.

Household size: the average household size of the households on Chiefdom A. The number of households in this Chiefdom is roughly 4430.



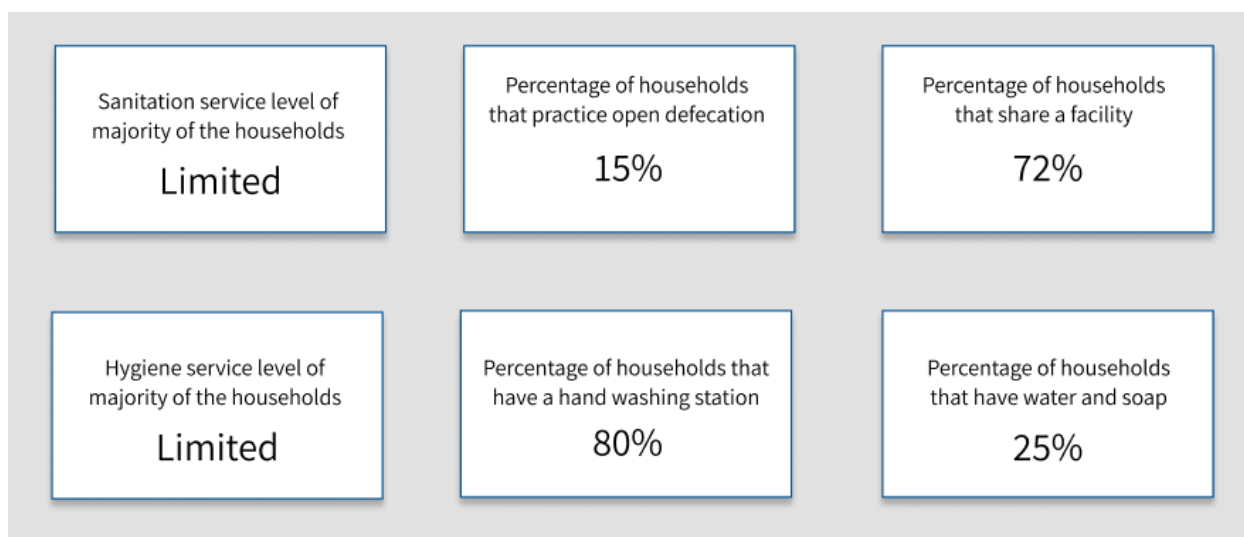
Overview 1: Key statistics for indicating vulnerability of households when considering water access of a fictional Chiefdom A.

Improved sources that are functional: The number of improved water points that are functional at time of data collection.

Households report depending on unimproved sources: The number of households that have reported collecting their drinking water from unimproved water points.

Families that report more than 30 min walk to an improved source: The number of families that reported having to walk more than 30 minutes to an improved water point to collect water and return home. When a household can collect water from an improved source but they have to walk more than 30 minutes to get water, the water service level is *unimproved*.

Furthermore, household level WaSH data can provide insight in the sanitation and hygiene service level of the households. The overview below (2) shows example statistics of sanitation and hygiene information. Please refer to annex 1 to see how the different service levels per household are determined.



Overview 2: Key statistics for indicating vulnerability of households when considering access to sanitation and hygiene of a fictional Chiefdom A.

For sanitation the first indicator is the type of facility used. When families do not have access to a facility and practice open defecation, in the present case 15%, the service level is *Open Defecation*. A second important indicator is whether a facility is shared, in the present case 72%. When families have access to an improved facility, but they have to share the facility with another family, the service level is limited. The target of the JMP is for every family to have a private and improved sanitation facility.

For hygiene the first indicator is the presence of a hand washing station, in this case 80% of the families have a hand washing station. The next indicator is the presence of water and soap. Only when all of these are present at time of data collection is the hygiene service level *basic*.

Schools

To indicate a country's WaSH services it is important to look at the WaSh services in public areas. JMP therefore requests information about the WaSH services in *schools* and *health facilities*.

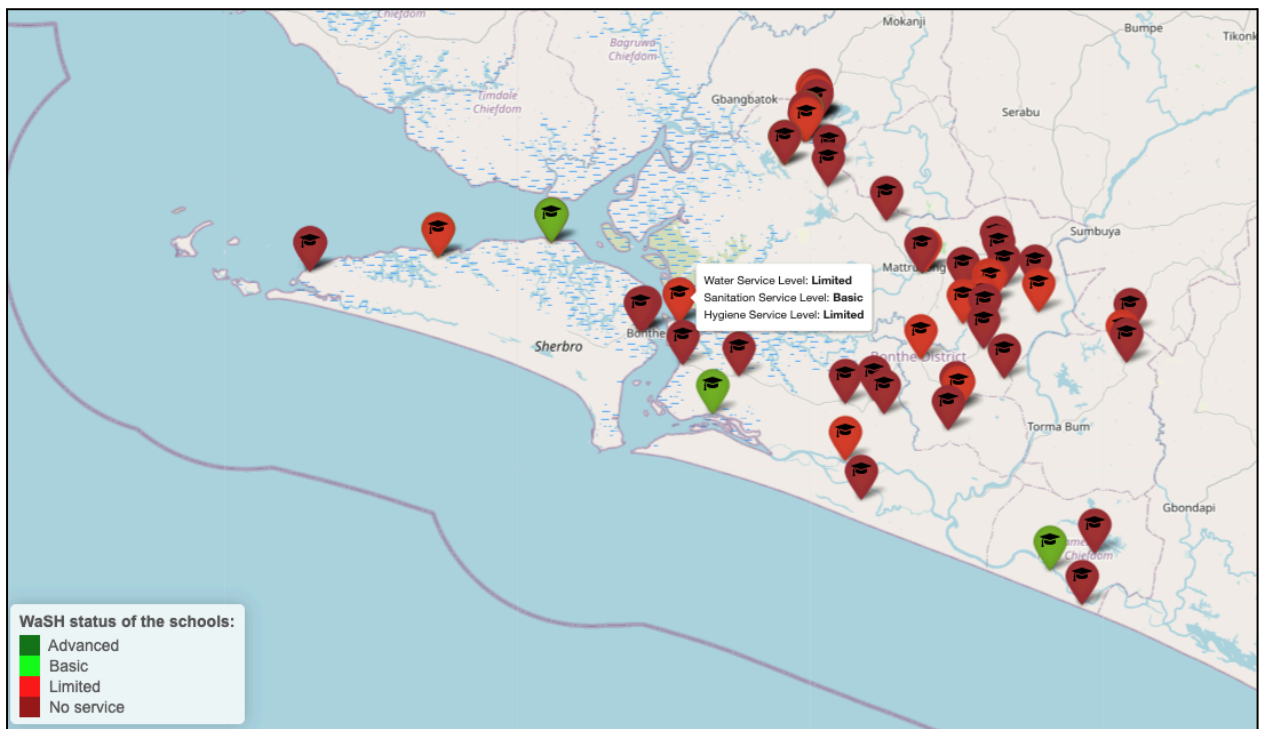


Figure 5: Schools with accompanying water service level.

The figure above (5) shows WaSH data per school. The color of the markers is a summary of the water supply, sanitation and hygiene service level. When all WaSH services are *advanced* the marker is dark green, when one of the levels is not advanced, but *basic* the marker is light green. This goes for all levels. When clicking on one of the markers, the underlying levels of the different services are shown. In the example, the school selected has a *limited* water supply, *basic* sanitation and *limited* hygiene services. The summary value in this case is *limited*.

The overview below (3) shows key statistics that can be used to indicate the WaSH services levels of schools in a specific area. By showing the amount of school going children and combining that with the WaSH service levels of the different schools, you can see how many children are dependent on what type of WaSH services.

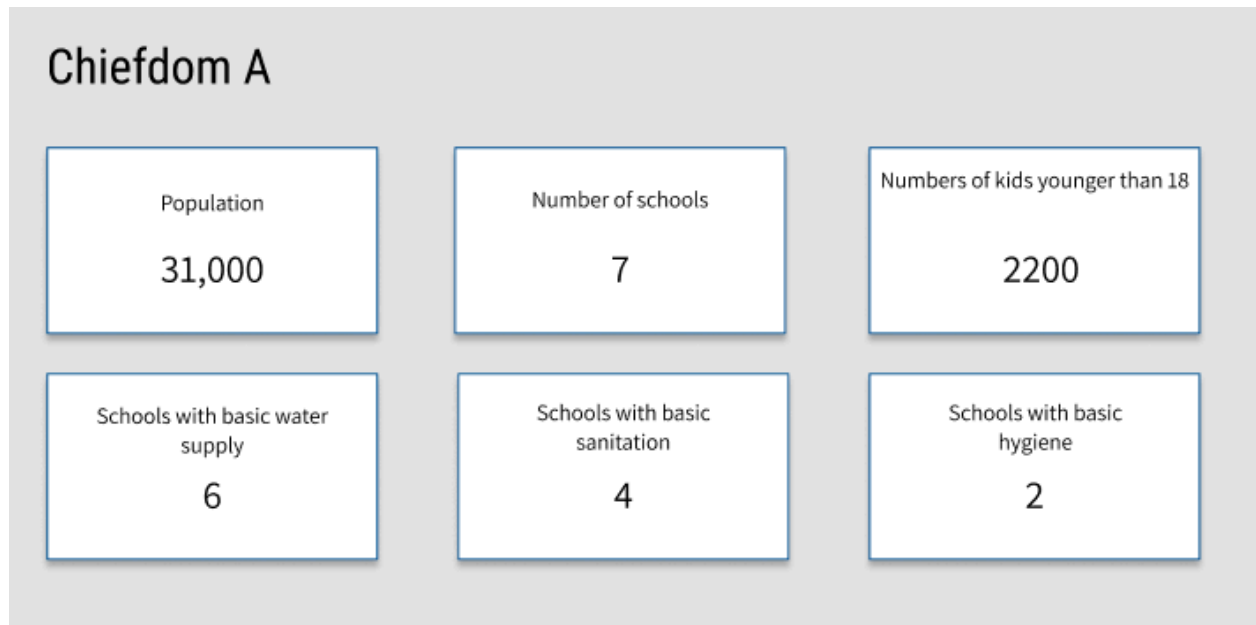
Population: the amount of people living in Chiefdom A.

Number of schools: Number of schools in Chiefdom A.

Number of kids younger than 18: Number of kids younger than 18 living in Chiefdom A.

Schools with basic water supply: Number of schools in the Chiefdom with water supply of JMP service level basic.

Schools with basic sanitation: Number of schools in the Chiefdom with sanitation of JMP service level basic.



Overview 3: Key statistics for indicating WaSH services of schools a fictional Chiefdom A.

Schools with basic hygiene: Number of schools in the Chiefdom with hygiene of JMP service level basic.

Health Facilities

The second type of public area the JMP includes in its monitoring is a health facility. The figure below (6) is similar to the figure displaying schools. The color of the markers is a summary of the water supply, sanitation and hygiene service level. When all WaSH services are *advanced* the marker is dark green, when one of the levels is not advanced, but *basic* the marker is light green. This goes for all levels. When clicking on one of the markers, the underlying levels of the different services are shown. In the example, the selected health facility has a *basic* water supply, *safely managed* sanitation and *basic* hygiene services. The summary value in this case is *basic*.

The overview below (4) shows key statistics that can be used to indicate the WaSH services levels of health facilities in a specific area. It shows the amount of health facilities in the area and the amount of health facilities with basic water supply, sanitation and hygiene.

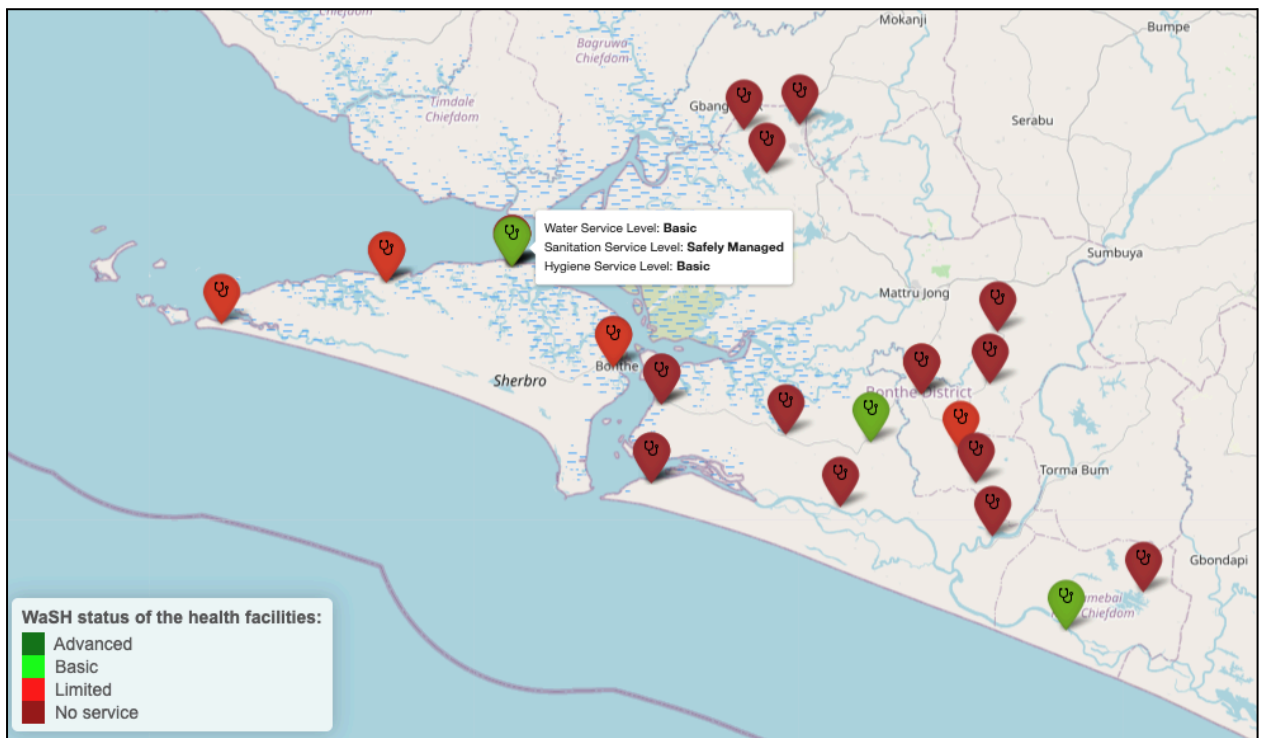
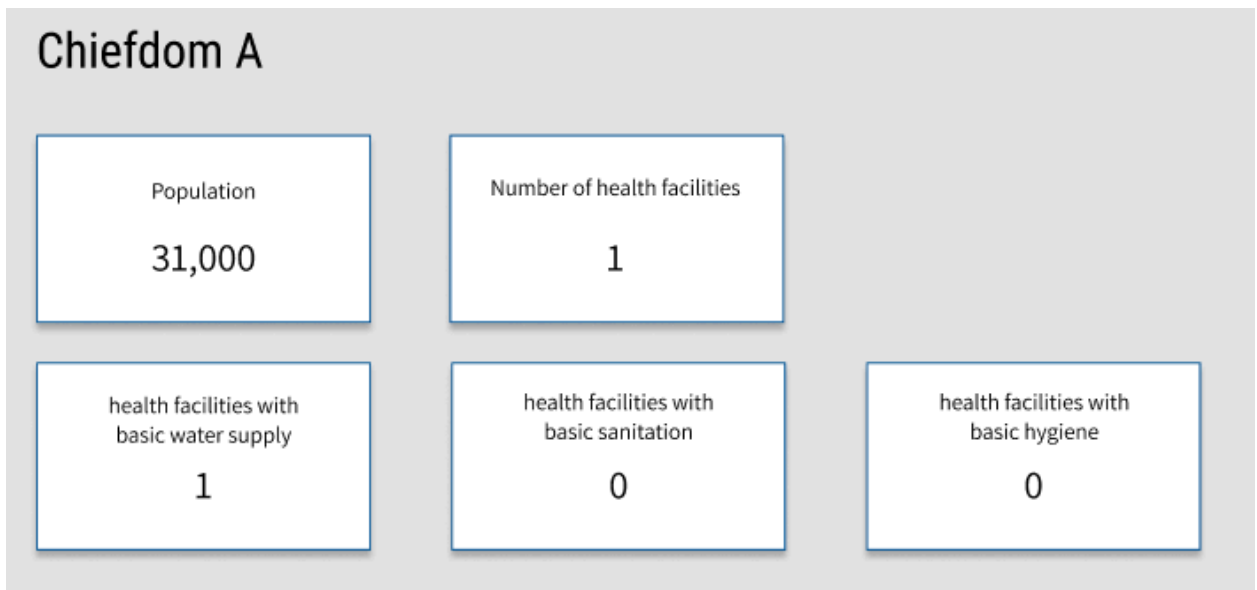


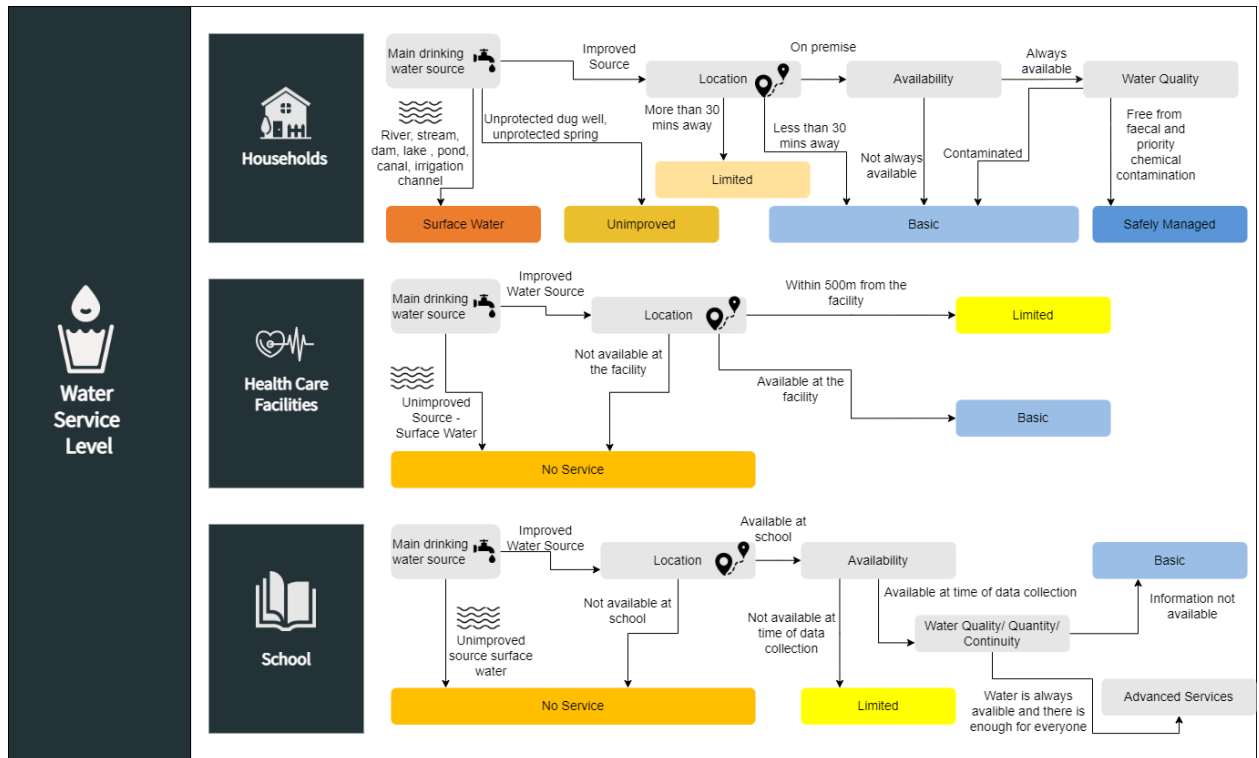
Figure 6: Health facilities with accompanying water service level.



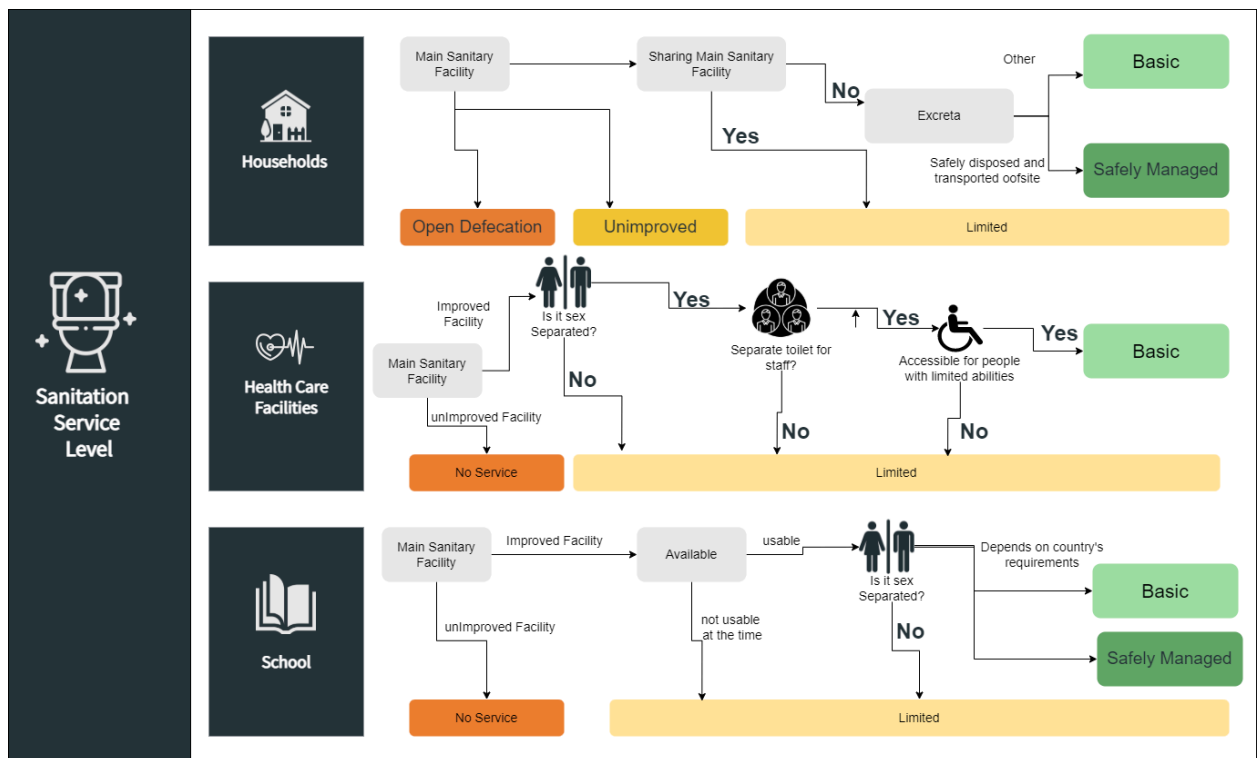
Overview 4: Key statistics for indicating WaSH services of health facilities a fictional Chieftdom A.

Annex 1: JMP Services Levels

Water access service levels



Sanitation service levels



Hygiene service levels

