Proposal for UNHCR / UNICEF

SamSam WATER

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Goal

The goal of this project is to provide insight in the possibilities and potential of online data sources and tools for smart measuring, data collection, information sharing and visualisation.

We will use one of the existing (or currently under construction) UNHCR camps as a case study. We will demonstrate the potential and options for different WASH topics (boreholes, piped networks, latrines, etc.) rather than an in depth study on one specific topic.

We are confident that these tools and methods can be of great help in planning, decision making, (field) operations and management for UNHCR, UNICEF and partners.

Step 1 - Office data collection, processing and visualisation

Collect, process and combine freely available online information such as:

- Topographical maps: useful to identify features such as rivers, springs, lakes, pipelines, etc. that can be used for hydrological analysis.
- Elevation maps: to identify flooded areas and potential refuge locations.
- Drainage patterns: locations of streams, gullies as potential sources of (drinking) water.
- Geological and soil maps: which can be used to understand the hydrogeological setting and identify potential sources of groundwater (depth, required type of drilling, etc.)
- Climate data: charts and maps with spatial distribution of rainfall/evaporation/temperature/etc.
- Reports and other studies that have been carried out and could provide useful information.
- Vegetation (i.e. from NDVI maps)

Collect and process existing information (both digital and on paper) from UNHCR/UNICEF staff members (both from the HQ and/or field offices). For example:

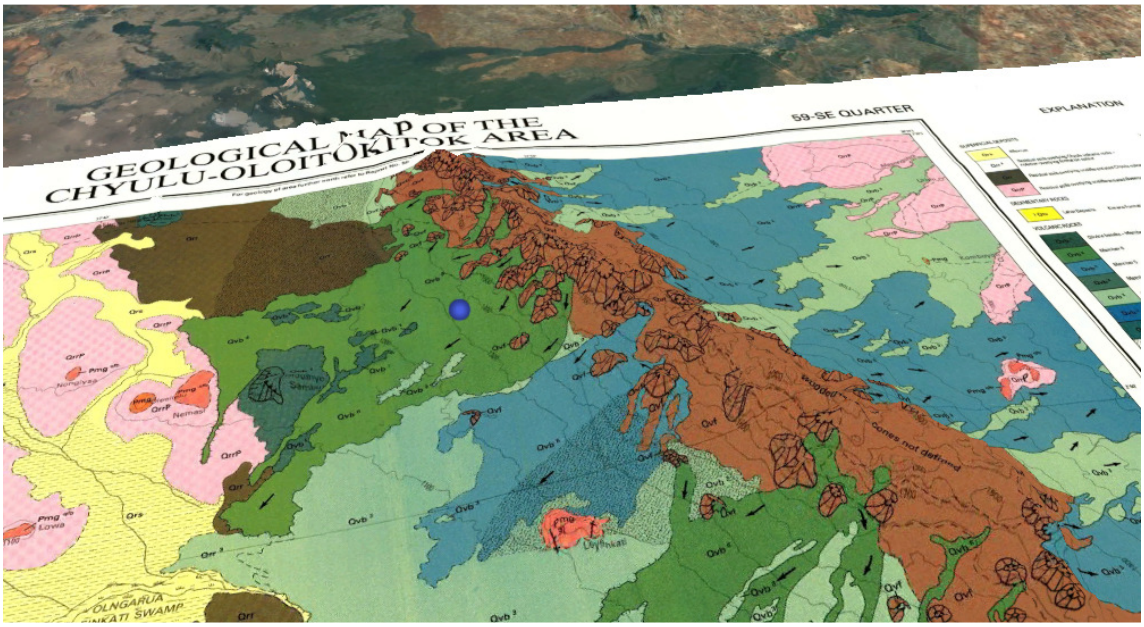
- Maps of piped networks that have been constructed in the past.
- Locations and details (drillers logs, yields, pump details, etc.) of boreholes.
- Report and maps of (water born) diseases.
- Maps of population and beneficiaries.

If satellite images are available for the site of the camp we can use those to carry out a more detailed analysis of the area. For example:

- Estimate the number of inhabitants, population density and water demand for different parts of the camp.
- Combine the above mentioned maps to create maps on potential water sources (e.g. shallow groundwater, deep groundwater, surface water, springs) based on geology, topography, etc.

All information will be stored in an online repository, available for everyone and also accessible through mobile devices (smartphones). If needed, the data can be password protected.

All maps are digitized and georectified (placed at the correct position on the map) in such a way that they can be viewed in the field with a smartphone in combination with the build in GPS functionality of smartphones for navigation.



Example of a scanned geological map used as overlay (including GPS navigation)

Step 2 - Field data collection and processing

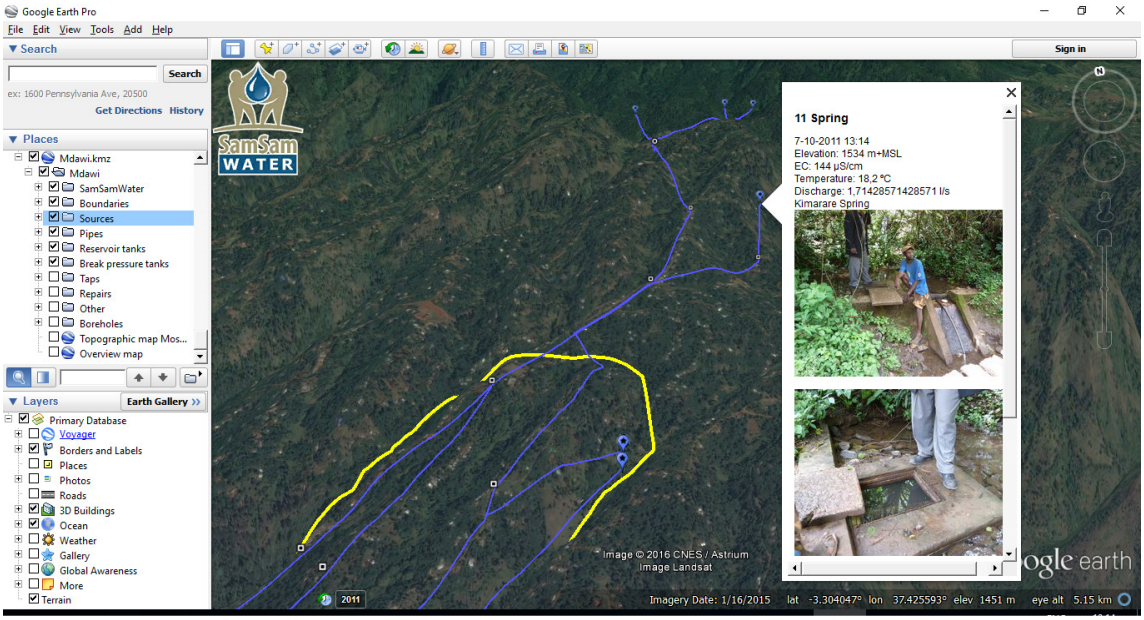
For an existing or currently under construction UNHCR camp *[location to be determined]* a field survey will be carried out to collect field data and process and visualise WASH related information.

Freely available digital tools (smartphone apps) will be used to map WASH features in the (potential) camp and vicinity. For example:

- Water sources (boreholes, wells, springs, etc.). Including measurements of discharge, capacity and water quality (electrical conductivity, nitrate, pH, etc.) if wanted.
- Latrines/washing facilities
- Tap points
- Piped water network (including features such as valves, meters or leakages, when detected in the field)
- Oral information from local inhabitants (if available)

The field campaign aims at showing the potential of the use of field GIS and collected data, not at collecting a complete dataset of the camp. The exact focus and items to be mapped will be decided in conjunction with UNHCR/UNICEF staff based on needs and priorities.

For each location properties can be recorded in the field and stored in the database using smartphones (or manually in the office).
Each location can be assigned a photo (or multiple photos) for easy reference or to highlight issues (such as a broken tap).
Other documents (e.g. PDF reports) can be assigned to the locations if required.



Example of a piped water supply network in 3D Google Earth (the complete interactive Google Earth file can be downloaded from http://www.samsamwater.com/projects/67/data/mdawi.kmz)

All information (both the maps and data collected in the office and the field data collection) will be made accessible in Google Earth and through online viewers. Anyone (password protected if necessary) can access, view and analyse this information. Since digital elevation maps are also available these can be used to perform for example 3D analysis of piped networks to identify potential issues such as low pressure or air locks.

Step 3 - Evaluation and follow up

All data collected will be made available in an easy to access format. We suggest an online data repository in combination with Google Earth so everyone can easily access the data.

Together with UNHCR/UNICEF we will evaluate the outputs and outcomes of this project. Based on the results we can advise on which components are useful for UNHCR/UNICEF and her partners. We can advise and assist in the implementation of this tools and methods for other regions and we could provide training of staff (both office and field staff) in the use and application of these data sources and tools. For example on:

- How to use digital tools such as Google Earth in preparing field visits
- The use of multiple datasets and combining the data in GIS
- Digital maps on smartphones
- Apps for field data collection
- Create elevation profiles (e.g. for planning piped networks)
- Smartphone GPS tools to measure distances and surface areas

Training for AMREF of WASH staff on smartphone GPS measurements and data collection

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