Case Study:

OpenStreetMap Uganda

This case study is part of a series that showcases successful usage of open-source software with a development objective in Uganda and around the world. It was prepared by the Response Innovation Lab in partnership with URIDU, as a part of the Open Source for Equality initiative (OSEQ) in Uganda.

What is OpenStreetMap Uganda?

OpenStreetMap Uganda (MapUganda) is a non-governmental organization (NGO) based in Kampala, Uganda that creates maps, develops open datasets, and builds a network of community mappers.

Access to data is a challenge for decision-makers and development organizations in Uganda. Limited data exist on the boundaries of districts and villages, land use, infrastructure, and public spaces. It can be expensive for a single company to collect this data. MapUganda addresses this challenge by mobilizing community mappers and making data freely available through the OpenStreetMap platform.

> OpenStreetMap Uganda was founded by Geoffrey Kateregga, Douglas Ssebagala and Deogratius Kiggudde. It was registered as an NGO in 2017 to promote community mapping and the use of open data to tackle social, economic, and community challenges.

Why use OpenStreetMap?

OpenStreetMap (OSM) is a platform to create and provide free geographic data that is collected by a community of mappers. The benefits of using OSM over other mapping software are:

1. Organizations can access the open datasets at no cost as long as there is attribution to OpenStreetMap and its contributors.
2. Satellite imagery is accessible at no cost through Bing Aerial Imagery, Maxar Imagery (Digital Globe), ESRI World Imagery, and Mapbox Imagery.
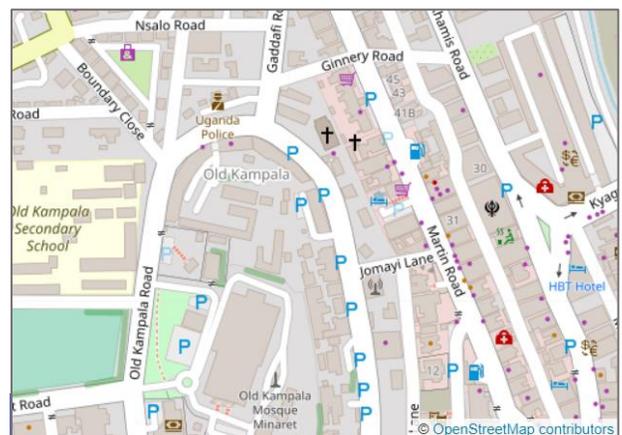
> **Open data** is structured, machine-readable data that can be freely used, shared, redistributed, and built on without restrictions.

3. OSM emphasizes local knowledge by mobilizing local mappers to contribute data and verify that data is accurate and up to date.
4. Data can be easily added by contributors and verified in one day.
5. It is integrated with other open-source software, such as Open Data Kit and KoBo Toolbox to easily collect, analyze, and map data from population surveys.
6. It collects geotagged information using Android devices to verify how and where data was collected.

The open data is licensed under the Open Data Commons Open Database License (ODbL), which allows users to share, create, and adapt the database, as long as attribution is given to OpenStreetMap and the derivative work is kept open through the same ODbL. This allows MapUganda to use, add and modify data while displaying the OpenStreetMap copyright notice on its work.

How does it work?

MapUganda contributes datasets to the OSM platform. Following the OSM model, MapUganda recruits and trains volunteer community mappers to collect and update data. They select an area of interest to map, remotely and then in the field. Each contributor has their own log-in and the datasets are mapped directly onto the OSM site, then validated. The data collected is public, such as transportation (sidewalks, roads, trails), structures (buildings, bridges, parks), and natural assets (trees, waterbodies, forests). The open datasets can be uploaded in mapping software, such as QGIS, to develop maps that can inform data-driven decisions.

Recruit and train mappers ➤ Field data collection ➤ Data validation ➤ Upload data onto OSM ➤ Use data in mapping software

MapUganda may collect additional survey information for a particular project using KoBo Toolbox or Open Data Kit. The validation process assures that no personal information collected is uploaded onto the OSM platform.

How does MapUganda operate?

MapUganda carries out five main types of activities that are geared towards improving the collection and use of open datasets for Uganda:

1. **Community building**: MapUganda is continually expanding its network of volunteer community mappers. They offer training on GIS, field data collection, map making, and drone technology. They have a trained community mappers in every district who are regularly collecting or updating information in the field.

2. **Promotion**: MapUganda promotes the OSM platform to local officials, Ministries, and policy makers to raise understanding about how it works, the potential uses, and the benefits of using open data. They raise local interest by organizing "*Mapathon*" events, bringing people together to map data around a given cause, or *drone missions* to give community members a chance to fly drones.
3. **Projects**: MapUganda applies to grants and responds to requests from NGOs for projects. They collect and map data for a specific purpose, such as a mapping urban drainage systems or digitizing cropland and farmer survey data for crop monitoring.
4. **Youth engagement**: MapUganda has a special emphasis on youth, providing training on mapping and data collection. They have a 3-month internship program with a high youth participation to gain skills and experience.
5. **Disaster response**: With the use of drones, MapUganda supports disaster response initiatives, getting imagery and data of areas affected by or susceptible to disasters to support decision-making.

> **"We want to empower local people to create and utilise data. The data is crucial to bring about decisions that are backed with data."**
> – Ronald Tumusiime,
> Project Operations and Finance

The activities of MapUganda are financed through a combination of grants, membership fees, and the program "**OSM in Schools**" as part of the African Digital Access Initiative (AFDI). The AFDI program has the objective of increasing digital literacy in the country, but many schools lack access to equipment. For a small fee, the MapUganda team brings equipment to schools on a rotating basis and teach students digital skills by leveraging the OSM platform.

What lessons were learned?

MapUganda has developed a network of 2,536 community members, has completed 29 mapping projects, and has collected data in all districts of the country. The following are three lessons learned from this experience.

1. **There is a general misconception that open data is not accurate**. For this reason, MapUganda works hard to promote and demystify the use open data, demonstrating that it is "ground truth data" contributed by well-trained local resources and that it goes through a validation process.

2. **Get local authorities to use the data**. When local authorities participate in the mapping activities, they have a greater awareness and confidence in the data being collected. When they *use* the data for planning, advocacy, or decision-making, they have an interest in ensuring that the data being collected is accurate.

3. **With basic training, the open-source software is easy to use**. The Ministry of Lands and Urban Planning required its urban planners to learn how to use open-source mapping software. MapUganda provided training on QGIS, OSM, and data collection tools (ODK, KoBo Toobox). The planners were pleased by the ease of use of the software and began using these tools in place of paper-based data collection.

How is OpenStreetMap Uganda contributing to gender equality?

The MapUganda team integrates gender equality into all its work within the organization, the community, and data collection.

"**By bringing OSM in Schools program to girls' schools, we can start from the primary level. That is one of the models to create interest in GIS at a tender age and help us to close that gap.**"
– Allan Mbabani, Executive Director

1. **Organization**: The MapUganda team is currently composed of 8 women and 6 men. They are continually trying to improve the recruitment and retention of women.

2. **Community**: Across all projects, MapUganda ensures that more than half of the community data enumerators are women. They are trying to close the digital gender gap through internships and the OSM in Schools program.

3. **Data**: MapUganda has carried out projects and events that collect data that can improve the health, safety of well-being of women.

Preventing Gender-Based Violence with OpenStreetMap

MapUganda has been involved in collecting data that can help prevent gender-based violence. Female genital mutilation (FGM) is still practiced in parts of Uganda. As part of a Global Mapathon, MapUganda and its community mappers helped create maps to provide information of safe houses that girls can use to escape the practice of FGM.