DRR IN ACTION CASE STUDY

Digitalizing the community mapping and transect walk tools in the EVCA

Theme of Case Study
Digital Community Mapping and Transect Walk

Country
Nigeria

Case Study Location
In various communities in Lagos and FCT in Nigeria

Background

Conducting Enhanced Vulnerability and Capacity Assessments (EVCAs) can present challenges, especially in urban and semi-urban contexts, and tools such as community mapping, can be less sustainable when paper-based. Communities can vary in size, change frequently and are heterogeneous in their characteristics, citizens, social and economic links.

In 2021, the Nigerian Red Cross began a Disaster Management Programme supported by the British Red Cross. The programme presented an opportunity for the Nigerian Red Cross to digitalize select tools in the EVCA and adapt these to an urban context.

This case study will focus on digitalization of two tools within the EVCA toolbox: 1- **community mapping**, and 2- **transect walk**. It will briefly summarize the methodology and technology used to move from paper to digital.

Community Mapping

drawing and visualizing on a map the resources, vulnerabilities, and hazards in a community

Transect Walk

walking through the community to observe and discuss the daily activities, the surroundings and the risks and resources

Photo: Verification of capacities and vulnerabilities with community members

What did the action seek to change?

To provide communities, as well as National Society branches, access to both offline and online map products and data to use for decision making and planning. These can then be used to inform disaster risk reduction planning in the community or advocacy with various stakeholders. The maps can also serve as a reference during emergency response.

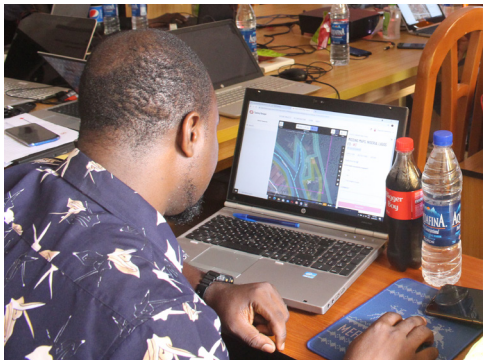
What key actions were taken to achieve change?

Digitalization was achieved through a hands-on training exercise (covering community mapping and transect walk) combined with practical implementation based on the Missing Maps methodology. The methodology is divided into three phases: tracing aerial imagery, field mapping, and sharing maps.

Tracing Maps

Remote Volunteers trace satellite imagery into OpenStreetMap

During the first phase Nigerian Red Cross volunteers and HQ staff used a Tasking Manager to trace aerial imagery (e.g., from satellites) to create a basic digital map of the project communities in OpenStreetMap. The tracing can be done during organized events called "mapathons", where groups of volunteers come together to map. Digital volunteers can contribute at home or anywhere in the world. This creates an initial base map. These base maps only show building and road outlines with no local detail, such as the type of building. Community maps were then created from this data using GIS software and printed on A1 and A4 size paper. The larger maps were used for focus group discussions during the EVCA, initial mapping and deciding which routes to take during the transect walk and the smaller A4 maps were used for direction and reference during the transect walk.



"Mapping buildings and roads from aerial imagery at a mapathon"

"Identifying capacities and vulnerabilities with community members"

Field Mapping

Community volunteers add local detail such as neighborhoods, street names, and evacuation centers

The second phase, community or "field" mapping, is where members of the community, using their local knowledge, will add detail to the map. In reference to the EVCA, this is when community members identify the capacities (e.g., schools, health facilities, places of worship, etc.) and vulnerabilities (e.g., flooded areas, refuse dumps, etc.). Community members with support of the Red Cross will carry out a transect walk of the community and add the location and description of the vulnerabilities or capacities via mobile data collection (for example using Kobo Collect).

By using the Kobo form on their mobile phones, the transect team could quickly select from a drop-down menu the type of infrastructure or service to be added to the map and rank it as low, medium or high vulnerability, capacity or both.

"Community mapping using mobile data collection tools"

They could also add a short justification description and a photo. Once the transect walk is complete, the data will be downloaded and added to the initial base maps which will be verified and validated by community members to ensure all community capacities and vulnerabilities have been captured.

Humanitarian organizations use mapped information to plan risk reduction and disaster response activities that save lives

Sharing Maps

The third phase is sharing the finalized map with the communities. The communities receive plasticized maps in A1 format. In addition, local data collected that is public knowledge, such as capacity information, is added into OpenStreetMap and made accessible to all. Communities will be able to use the information on the maps for disaster risk management activities (e.g., drafting contingency plans, local urban development planning, and advocacy with stakeholders for example on infrastructure and services). The Nigerian Red Cross can use the information on the digital maps to plan preparedness and response activities.

What are the essential steps?

The digitalized EVCA community mapping and transect walks takes three days to complete but preparation work is required beforehand; steps 1 and 2 are carried out prior to conducting the EVCA.

Tech Tip
Missing Maps --> Used to map areas where people live at risk of disasters and crises by contributing to OpenStreetMap (OSM) so that individuals, communities and organizations can use the data and maps to better prepare and respond. https://www.missingmaps.org/about/

Step 1	Hold a Missing Maps mapathon where volunteers and staff trace buildings and roads from aerial imagery into OpenStreetMap to create base maps
Step 2	Use GIS software (e.g., QGIS) to create and print A1 & A4 community maps from Step 1
Step 3	Hold a stakeholder engagement meeting to determine vulnerabilities and capacities to be mapped
Step 4	Create a Kobo form for Mobile Data Collection
Step 5	Conduct Kobo form training for those involved in digital community mapping and transect walk
Step 6	Install the Kobo Collect app and download the Kobo form on mobile devices.
Step 7	With community members, use A1 maps to identify capacities and vulnerabilities in the community and plan out transect walk route

Tech Tip
These maps can be created with GIS software. Print multiple copies and ideally have a "street" and "satellite imagery" map – STEP 2

Tech Tip
The A4 maps will be used to help guide teams around the community, whereas the A1 maps will be used as a tool with the community to identify capacities and vulnerabilities and used to support creating a route around the community.

Step 8	With community members,complete the field mapping exercise using Kobo Collect to record capabilities and vulnerabilities as part of the transect walk. Use A4 maps to assist in guiding your way around the community.
Step 9	Download the results from the Kobo forms and add share and debrief with the wider EVCA team.
Step 10	Use GIS software to create and print community maps showing capacities, vulnerabilities and both capacities and vulnerabilities layers, for example as different coloured icons on the map.
Step 11	Validate maps with communities in focus group discussions. Add any additional vulnerabilities or capacities suggested by the community members
Step 12	Print validated maps and provide them to the communities to be used for their community DRR action planning and contingency planning
Step 13	After community mapping, add local detail collected such as capacity information into OpenStreetmap to create a richer online map if the community

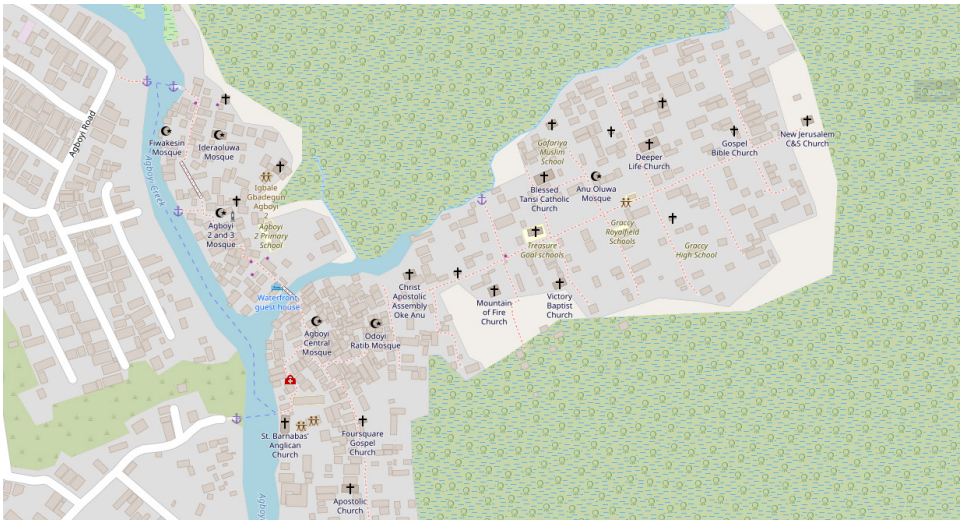


Photo: Community map in OpenStreetMap containing information collected during the digital community mapping exercise

Data Protection

Any data collected that is public knowledge (example: schools, health centers, etc.) can be added to OpenStreetMap using the online editor. All private and/or sensitive information (non-public), such as vulnerability information, is stored with the National Society.

Quotes:

"This is the first time the community is on the map, and people, the government, can see that they exist and have capacities" - Nigerian Red Cross

What were the Achievements and Impacts?

The digitalization of the community mapping and transect walk tools of the EVCA have contributed to:

- Online and offline map data and products to be used for local disaster risk management planning, for advocacy with stakeholders, and as reference maps during emergency responses. The maps are more accurate than hand-drawn maps and will last longer than maps on flipcharts.

- A publicly available online map of communities on OpenStreetMap editable by anyone if change occurs, displaying features such as buildings, roads, and capacity information such as water points, schools, or health facilities. This is especially an advantage in urban and semi-urban areas as the maps can be more easily updated and shared.
- A digital data repository of community capacity and vulnerability information for disaster risk management activities, such as for community risk reduction action planning, contingency and or preparedness planning and response by the community and Nigerian Red Cross.

Additionally the process and training for the digitalization of the community mapping and transect walk tools have also contributed to:

- The Nigerian Red Cross gained skills to hold Missing Maps mapathons which will enable them to create accurate base maps and be able to use open geographic data from OpenStreetMap, to prepare and respond to emergencies.
- The Nigerian Red Cross familiarized themselves in mobile data collection (e.g., formulating questions, collecting data) and presenting results through visualization (e.g., maps) for decision making.

Tech Tip
If capacity data is going to be added to OpenStreetMap post digital community mapping – use the OpenStreetMap tagging guide to support in creating the KoBo form (https://wiki.openstreetmap.org/wiki/Map_features). Ensure that the form has a GPS question, which will assist in mapping locations of capacities and vulnerabilities.

What digital tools are being used in EVCA?

The Nigerian Red Cross used the following digital tools while conducting the EVCAs:

1. **OpenStreetMap:** This is an open-source digital map of the world that is free to use and edit. The Nigerian Red Cross used the Missing Maps (link) methodology where after a basemap has been traced from aerial imagery, community members and volunteers populate these with details about their communities (use of tools within OpenStreetMap and Missing Maps included: tagging guides, HOT Tasking Manager, Editing tools: ID Editor and JOSM).
2. **KoBo Toolbox:** This is used for mobile data collection during the transect walk and community mapping exercises to gather the details on hazard exposure, vulnerabilities, capacities to be added to the base maps.
3. **GIS Software:** This is used to create layered maps to be printed and shared with the community for future use. Nigerian Red Cross used QGIS which is a free and open source GIS software

Quotes:

Try to do the community mapping exercise in the morning; walking around a community for several hours in high temperatures can be too much for volunteers and community members!

Can the digital tools be used outside of the EVCA?

KoBo Toolbox (mobile data collection tool), OpenStreetMap (digital mapping tool) and GIS software are tools that the Nigerian Red Cross can use in non-emergency setting (planning, project design, data collection, monitoring etc.), as well as during emergencies for accurate assessments and more timely informed decision-making. KoBo toolbox can also be used for community feedback mechanisms.

Quotes:

"I can now view my community on my phone, show everyone, and see all the capacities"
- Community member

What are Key Lessons Learned?

Validation of Survey

Prior to carrying out the assessment within the community, a sample survey with proposed questions was shared with relevant stakeholders. This allowed specific elements of the survey (terminology, concepts, capacities and vulnerabilities, etc.) to be adapted to the local context. It was also an opportunity to add any missing instructions and/or nuances, to bring as much clarity to the survey as possible and ultimately generate a clean output dataset. Once ready, the survey was validated by the team before setting out.

Reading Maps

Not everyone is used to reading a map of their community; this can be especially true in remote or unmapped areas. Instead of teaching individuals how to read a map, walk community members through the map (in their geographic communities) using landmarks and points of interests to locate themselves.

Time required for the mapping

Plan sufficient time and resources for the field mapping day(s). Entering the vulnerabilities and capacities on the mobile phone via the KoBo form (including taking the GPS location and photos) can take 1-2 minutes per item. Some of the more urban communities had lots of points that needed to be collected and added to the map. In other more rural/semi-urban areas, distances were far and required long walks or vehicle support to get from one point to the next within the community. Additionally, ensure that you have more than one mobile data collection phone per team and divide into at least 3-4 teams to cover more areas. Even if there is no mobile network, the team can collect and save the data and then upload it later when network or wifi is available. In the EVCA schedule, plan in time (at least 1 day) required to process the data and create maps before you can validate and print the maps.

What were the Good Practices arising from this action?

In the case study presented here, the Nigerian Red Cross were able to adapt the community mapping tool to a digital methodology in urban and semi-urban communities. This enables sharing of map information in online and offline formats, possibly putting the community on a digital map for the first time, plus creating a digital data repository. Both these support disaster risk management activities, such as preparedness and risk reduction planning by the community and Nigerian Red Cross as well as for advocacy with stakeholders.

Digital mapping might seem less participatory but community engagement and accountability is key. The team that went on the transact walk and digital mapping included members from the community resilience team and community volunteers to guide the team and explain vulnerabilities and capacities. The route for the transact walk was decided based on advice of the community resilience team members. If time allows, involve more youth and community members in 'crowd-sourcing' of the community data.

The maps with the vulnerability and capacity data collected are validated in community meetings and the final maps are handed over to the community with the EVCA report.

Digitalizing components of the EVCA can seem like a daunting journey for some National Societies on which to embark, as they may feel less familiar and savvy with technological advances. The great news is that there are a lot of available resources, including blueprints for tried and tested methodologies on how to proceed. Another key aspect of the digitalization efforts was engaging with Missing Maps, which includes several National Societies and IFRC, offering knowledge and support for digital community mapping.

References for this Case Study

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Collaborators for this Case Study:
Nigeria Red Cross,
British Red Cross

Contact Person for this Case Study:
Paul Knight
GIS & IM Technical Adviser
British Red Cross
Email: paulknight@redcross.org.uk