DRAFT

HOW-TO NOTES

Getting on the Map:
A Community's Path
to Better Services

A COLLABORATION OF

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IMPROVING DEVELOPMENT OUTCOMES

SOCIAL DEVELOPMENT

ACKNOWLEDGMENTS

<u>HOW TO NOTE:</u>

<u>GETTING ON THE MAP: A COMMUNITY'S PATH TO BETTER SERVICES</u>

<u>D R A F T</u>

A. WHAT IS AN INTERACTIVE COMMUNITY MAP?

An interactive community mapping (ICM) process engages individuals in creating a map of their community. By facilitating the development of improved maps of roads, settlements, buildings, local businesses, and other services, the ICM process aims to help community members, governments, civil society organizations (CSOs), and development partners to better assess the needs and concerns of the mapped communities, and adjust their development activities accordingly.

As noted by Aleem Walji, the Innovation Practice Manager of the World Bank Institute, "maps have the ability to tell a story that becomes very compelling and hard to argue with." ICM can therefore be particularly valuable for the development of poor and marginalized communities that often appear as blank spots on traditional maps. The idea of ICM is to harness the collective wisdom and knowledge of these communities to become drivers of development. As part of the ICM process, local residents can use basic GPS devices to map roads, pathways, and points of interest in their communities, and then import the data into a public database, through which dynamic and editable maps are generated. Further, the ICM process facilitates the creation of "social" maps of the community, encouraging local residents to share news, reports, and stories that can be of interest both within the community and outside of it.

ICM has several advantages over the traditional mapping process.

- *Speed*. Traditional cartographic agencies develop maps over several months or even years. Benefiting from innovations in geo-spatial technology and access to local knowledge, the ICM process occurs substantially faster.

- *Dynamic nature*. While traditional maps remain static and considerable effort is required to update them, interactive community maps can be easily edited, changed, and updated at any time.

- *Costs*. The ICM process relies on relatively cheap and basic technological devices, and employs free and open source software. Mappers belong to the community that is being mapped and bring to the project unique tacit knowledge of their living environment. By and large, they volunteer to participate in the mapping process after completing a basic technological training (offered by ICM experts). The costs of the ICM production are therefore substantially lower than the expenses needed to fund a traditional map.

- *Granularity*. Most mapping efforts focus on large-scale geospatial data and lack local context. The ICM process aims to provide granular information, tapping the local knowledge of community members. The nature of the ICM process allows "zooming in" and "zooming out" according to the specific information needs and demands of the community and its stakeholders—the information provided on the map may be as detailed, localized, and contextualized as the designers of the map wish.

- *Community empowerment*. By positioning community mappers at the core of the mapping process, ICM provides unique opportunities for community empowerment

and engagement. The ICM process offers community mappers technological skills and aims to amplify their voice. These aspects are absent from any traditional mapping exercise.

Interactive community maps typically aim to achieve two major development outcomes.

- *Improved service provision.* A key objective of the ICM process is to help improve public service provision in the community. By drawing a clear picture of the social and economic conditions in the area, ICM helps decide what types of service provision interventions are required, how they should be implemented, and where. As community members are engaged throughout the ICM process, it also encourages them to identify local solutions to the challenges their community faces.

- *Capacity building and empowerment.* The ICM process is deeply participatory by its nature—it relies on the community for all stages of the mapping process. This approach is valuable for several reasons.

  ➤ Community mappers acquire new technological skills (learning to use GPS devices, and getting familiar with software programs and social media). In marginalized communities with high rates of unemployment among the youth, these skills can considerably benefit local residents by offering them employment opportunities.

  ➤ The "digital storytelling" aspect of ICM amplifies the voices of community members. It allows them to articulate their own needs, issues, and concerns, rather than rely on mainstream media, which often presents them in a negative light. ICM allows participants to share local news and stories within their community, and also gives a better perspective of their life to outsiders.

The goal of this note is to guide project task teams through the design and implementation of the ICM process. Relying on good practice examples, the note aims to provide a better understanding of how the potential benefits of ICM can be translated into tangible results. The remainder of the note outlines the technology of ICM, delineates the enabling conditions for ICM interventions, and offers a step-by-step guidance of how to effectively design and implement ICM.

B. THE TECHNOLOGY OF ICM

There is no single technological approach to creating an interactive community map. Currently, OpenStreetMap (OSM) and Google Map Maker are the most common platforms employed for ICM purposes.

- OSM is a collaborative web project that aims to create a free and editable map of the world, built entirely by volunteers. The maps on OSM rely on data collected from GPS devices, aerial photography, satellite imagery, publicly open sources of geospatial data, and local knowledge. All the data is available for public use under a Creative Commons license (allowing to download and use the data for any purpose, and only requiring attribution).

- Google Map Maker encourages individuals to review and edit the satellite imagery that is available on Google Maps. The Map Maker allows three types of contributions to Google's existing maps: placemarks (points of interest, such as schools, local businesses, or hospitals); lines (roads, railways, rivers, etc.); and polygons (boundaries and borders, parks, lakes, etc.). The contributions of new users are reviewed and monitored by more experienced users in order to ensure accuracy. Contrary to OSM, data that is submitted to Google Map Maker is not available under open licenses for public reuse and becomes Google's property.


Box 1. Map Kibera: The first multifunctional ICM

Map Kibera, a community information project started by a team of social activists in October 2009, is an interactive grassroots map of Kibera, Nairobi — one of the largest slums in Africa. Although many CSOs and development organizations have been present and active in Kibera, it has largely remained a blank spot on the map. This lack of openly available geospatial data and other public sources of information about the slum led a group of social activists to create Map Kibera.

The underlying idea of Map Kibera is that without basic geospatial knowledge, it is impossible to conduct an informed discussion on how the life conditions in Kibera can be improved. The Map Kibera team expected that the provision of such information would facilitate better coordination, planning, and advocacy efforts within the community, and between the community and the government.

In the first stage of its operation, the Map Kibera team recruited volunteer community mappers who reside in Kibera to map "points of interest" in the slum, using simple GPS devices and uploading the collected data to OSM. The mappers collected data about the location of clinics, toilets, water points, places of worship, and more. On top of this basic geospatial information, the mappers added a "storytelling" layer, capturing personal accounts, stories, and news of Kibera residents.

As part of the second stage, Map Kibera deepened its coverage of life conditions in the community, and collected more contextualized information in the areas of health, security, education, and water/sanitation. At this stage, the Map Kibera team also introduced the Voice of Kibera website — an online news and information-sharing platform for the Kibera community.
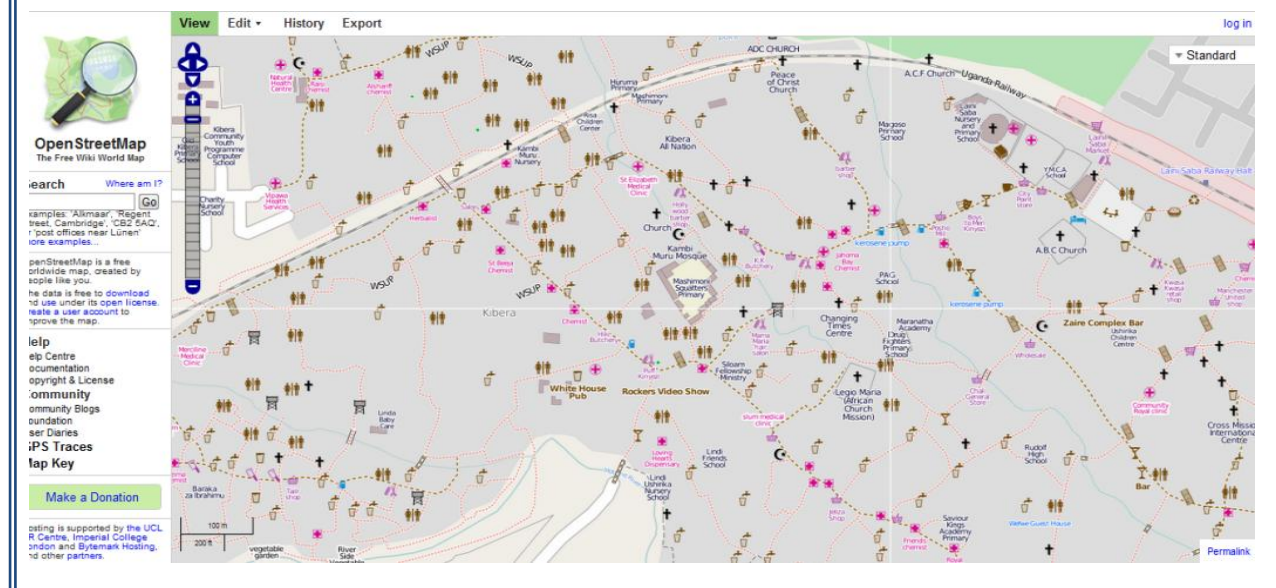
C. ENABLING CONDITIONS FOR ICM

The design and implementation of an impactful ICM process requires close attention to the enabling conditions that facilitate the translation of ICM into concrete development outcomes. The major drivers of effectiveness are the following.
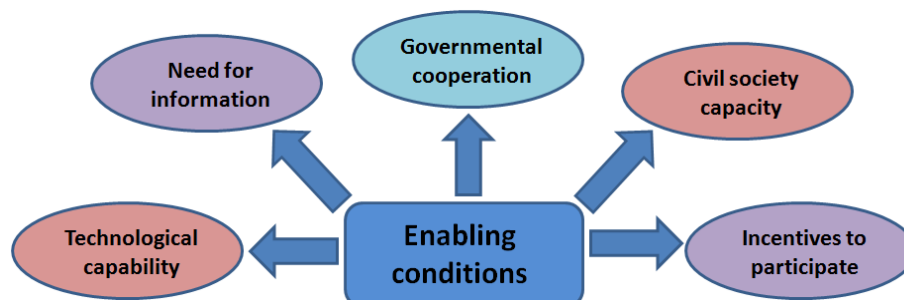
- **Internet access and technological capability**.

    Naturally, high internet penetration rates and digital literacy are likely to facilitate the ICM process. The availability of internet access makes the transition of data from GPS devices into the mapping software easier, and widespread technological knowledge enhances the pool of potential community mappers.

    However, the lack of internet access and technological capability does not make interactive community maps obsolete. In fact, it may even enhance the importance of the mapping process to the local community. As the ICM process offers local residents to use technological skills and experience, it may open for them valuable employment opportunities in the future.

Box 2. Overcoming lack of access. Lack of internet access does not only make the ICM process more difficult. It also limits the usefulness of the resulting map to members of the community, as it will not be easily accessible to them. Map Kibera attempted to overcome this challenge.

- *First, after the completion of the ICM process, the team of Map Kibera printed out the map on large posters and distributed across Kibera. Relying on these printed maps, the team encouraged the community to add more contextualized hand-written information.*
- *Second, the team of Map Kibera created and distributed a printed Atlas of Kibera, containing the following materials: five detailed maps of Kibera that focus on health, education, water and sanitation, security, and religious institutions; a large scale map of the whole area of Kibera; and a description of the Map Kibera project. The Map Kibera team distributed the map to schools, CSOs, and government representatives, encouraging them to use the map as part of their activities in the slum.*

- **Identified need for information.**

    ICM would naturally be most helpful in places that have not been mapped before. However, an effective ICM process should not only target blank spots on the world map, but identify specific needs and demands for information, as well as concrete ways

in which an interactive community map would benefit its prospective users—community members, CSOs, public officials, development partners, etc. Thus, although lack of previously available geospatial information is certainly a signal that an ICM could be valuable, a more nuanced assessment of the information conditions on the ground is necessary for an impactful implementation of the ICM process.

- **Governmental cooperation.**

    As local government is the one ultimately responsible for the provision of public services in the community, governmental cooperation with the ICM process can be pivotal for its impact and sustainability. Based on the information provided by the map, public officials may allocate additional resources to particular areas of concern or reallocate funds that have already been assigned in order to better cope with community problems. Public officials' endorsement of the ICM process may also bring on board additional stakeholders and help distribute and utilize the map when it is complete. The ICM process can be beneficial for public officials as well, as they may gain valuable and previously unavailable information about the conditions and concerns of marginalized and poor communities under their jurisdiction.

    Public officials, however, do not always realize these benefits and may fail to cooperate with the process. The implementers of ICM projects can therefore play a key role in the ICM process by bringing local public officials on board, and conveying to them the benefits of the map.

    > *Box 3. Securing governmental support. The support of the World Bank to the Map Tandale project (see Box 15 below) is exemplary of this strategy. The Bank acted as a "matchmaker" and networker in this case. It introduced the city officials of Dar Es Salaam to the concept of ICM and to partners that could implement the project, and worked with the Ardhi University to embed community mapping into the curriculum of Urban and Regional Planning studies and engage students in the ICM process.*

- **Civil society capacity.**

    The creation of an interactive community map is typically the easiest part of the ICM process. The map itself can be accurately developed by external parties, who recruit community members to map their living environments and transfer the gathered data to an OSM platform. However, in order to ensure that the map will be used and actual development outcomes will be achieved, local civil society should play a key role in the process.

    Local CSOs and social activists are the main stakeholders of any effective ICM endeavor, assuming responsibility over community outreach and engagement efforts, helping recruit and engage community mappers, arranging the logistics for the process, publicizing and distributing the map once it is complete, and utilizing it for their own activities. The presence of local civil society and its capacity to perform these activities are central to the creation and impactful use of the map.

- **Incentives to participate.**

  The incentives of local community members to participate in ICM can be tricky. On the one hand, payment for ICM can contradict the basic ideas and principles of Open Street Maps, which are created by and for the community. On the other hand, engaging committed volunteers may simply be impractical in poor communities. Volunteering for a common cause (let alone a cause supported by wealthy development partners) is not a natural decision for young people, many of whom are unemployed and in urgent need of income. The incentives of community members to take part in ICM should therefore be carefully considered.

  ➤ In some cases, the technological training that community mappers receive for free as part of the ICM process may suffice to keep them engaged with mapping activities.

  ➤ More frequently, however, some payment or reimbursement to encourage the continuing commitment of community mappers may be required.

  > *Box 4. Remunerating community mappers.* In Map Kibera, for example, community mappers who participated in the first, general stage of ICM received an "appreciation" payment at the end of the mapping exercise. During the second stage of mapping, the Map Kibera team attempted to identify a local self-supporting funding model, but eventually ended up paying the group.

D. STEP-BY-STEP DESIGN AND IMPLEMENTATION OF ICM

The remainder of this note provides task teams a step-by-step framework for the design and implementation of ICM interventions. The suggested steps are as follows:
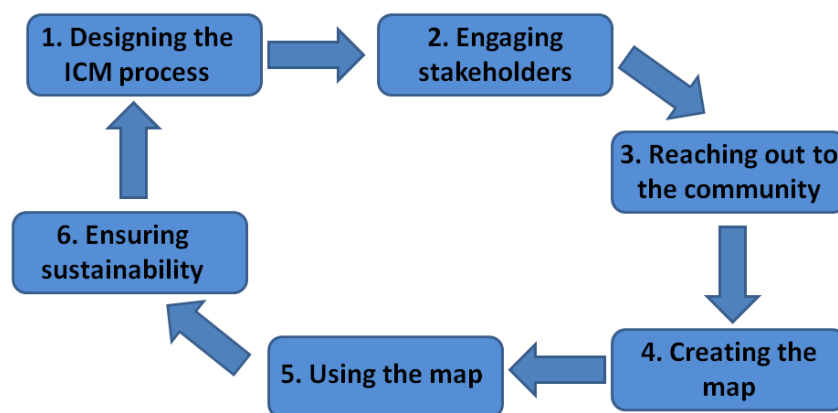
Step 1. Designing a Demand-Driven ICM

The technological aspects of creating an ICM are usually the easiest ones. The more difficult and challenging factors are community engagement, governmental cooperation, sustainability, and impact. In order to maximize the chances that the outcome of the ICM process will satisfy community needs and that the map will be used by relevant stakeholders, the design of the ICM process should be as demand-driven as possible. It should start with several basic questions.
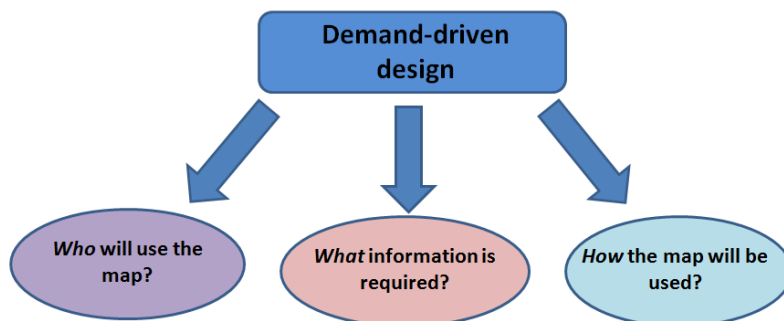
- *Who will use the map?*

It may be tempting to believe that if previously unavailable geospatial data reaches the public sphere, someone will make good use of it. However, this is only rarely the case. More often, a map that is designed for general use and does not satisfy concrete needs and demands of the community and the relevant stakeholders will be under-utilized.

> *Box 5. Supply and demand in Map Kibera. The initial idea of Map Kibera was to focus on the supply side of ICM – create an accurate map of Kibera and assume that it will be used by interested parties for a variety of purposes. The experience of the Map Kibera team showed, however, that their data mostly remained untouched. This situation only changed when the team began collaborating with local CSOs, and mapped data that responded to the concrete needs of these CSOs.*

An effective ICM process should therefore begin with the identification of the prospective users and targeted audience of the map. Typically, such users include the following:

➢ *Community members.* Although the interactive community map represents their living environment, members of poor and marginalized communities are unlikely to access (let alone use) the map in its online format. Targeting this audience therefore requires a series of offline activities that would make the map more accessible and understandable to the community (e.g., printing out the map and distributing it in public places, and holding community forums).

➢ *CSOs.* These are the most likely users of the map, who may be interested in using it as part of their development and advocacy activities. An ICM process that targets this audience should be structured around the information needs of CSOs and present to them the resulting map in a way that is most helpful for their activities.

➢ *Government.* Local government representatives may be the most impactful users of an interactive community map, as they are typically the ones responsible for the provision of public services in the community. Maps that target governments as their audience require the understanding of governmental needs and priorities, along with a close collaboration with public officials throughout the ICM process.

➢ Other users of ICM may include *private parties* (e.g., private service providers that operate, or intend to operate, in the community, and aim to improve their effectiveness or enhance the scope of their services); *international organizations and*

donors; and *researchers*. Similarly to the other audiences, an ICM that aims to target these users should engage them as early as possible in the design process, and be structured around their information needs and demands.

- ***What information is required?***

  The types of geospatial data that are collected as part of the ICM process should be dictated by its local stakeholders (community members, CSOs, and local representatives), as they are the ones who know best what information is required and how they will use it.

  The best practice is to create a general multi-purpose map—one which includes roads, pathways, as well as major points of interest—and add a more detailed and contextualized layer of information that is of particular interest to the identified users of the map. Naturally, different users will need different types of data. A local CSO that attempts to address the water and sanitation needs of the community, a public official who works on security issues, and a group of community volunteers who collect trash would all need different types of data. The ICM process should understand satisfy the needs of all these potential stakeholders.
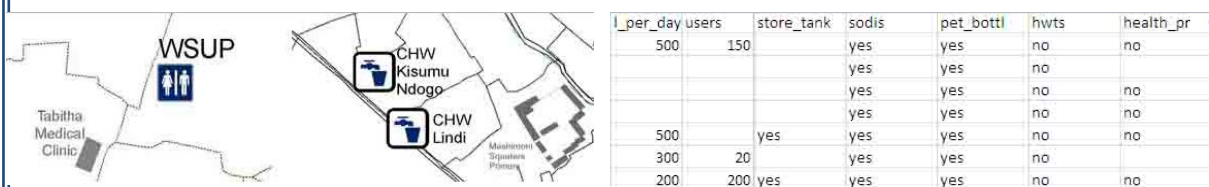
  - ➤ One of the advantages of an interactive community map over a traditional map is its *dynamic* nature—data can be edited and added to the map at any point after its creation. Thus, the initial identification of the required types of information should not be regarded as conclusive. As long as community mappers remain available, additional types of data can be collected and imported to the map at any time.

Box 6. Thematic geospatial data on Map Kibera.

At the first phase of the implementation of Map Kibera in Kenya, the designers of the ICM process guided community mappers to include on the map "points of interests," thus granting them discretion to decide what pieces of information should be part of the map. The points of interest the mappers chose to collect included clinics, toilets, water points, NGO offices, electric street lights, and some businesses. After one week of mapping, the mappers team compared the points of interests each of them collected and decided which of them should be part of the map.

The second phase of Map Kibera took a more contextualized approach, focusing on four specific areas: health, security, education, and water/sanitation. Mappers gathered detailed information on each of these topics. For instance, in the area of health, they collected information about the working hour of clinics and the services provided by them. This information was added on top of the original ICM layer, which only showed the location of the clinic.

After both phases of the mapping processes were completed, the Map Kibera team was approached by CSOs that work on water and sanitation issues. These stakeholders were interested in contextualized information on water and sanitation services available in Kibera. The Map Kibera community mappers went back to the field and collected the information required by the CSOs in a format that would be most useful for them (see the figures below).

l_per_day	users	store_tank	sodis	pet_bottl	hwts	health_pr
500	150		yes	yes	no	no
			yes	yes	no	
			yes	yes	no	no
			yes	yes	no	no
500		yes	yes	yes	no	no
300	20		yes	yes	no	
200	200	yes	yes	yes	no	no

Interactive community maps are typically designed for two general purposes: providing open and accurate geospatial data, and creating space for "digital storytelling" — encouraging residents to share experiences, news, and stories from the life of their communities. As part of this general concept, some more specific aspects should be considered.

➢ *Objectives.* The impact of ICM will increase if it aims to achieve specific objectives, rather than just create a general public source of information. Such goals may include, for example, improving drainage and waste collection, improving the services of clinics, or fixing broken pathways. The pursuit of each of these goals requires a slightly different design and implementation strategy for the ICM process.

➢ *Format.* An ICM process may result in an online interactive map that is accessible on a designated website, spreadsheets that contain non-encoded geospatial data, print-outs of maps that are presented as posters in public places, or (most frequently) all of the above. The format of the map will depend on its audience and the goals it aims to achieve (for example, see a discussion of the Atlas of Kibera in Box 2).

Step 2. Establishing partnerships on the ground

The effectiveness of ICM depends to a large extent on the cooperation of local communities. To ensure that the ICM will be used, sustained, and further developed upon completion, local CSOs, groups, and community members should be the entry point to the creation of the map and sense that they "own" it from its inception.

The ICM process should therefore rely on robust partnerships with groups and organizations that are permanently active in the community. Such partnerships are important on all stages of the ICM process.

- In the beginning, local CSOs, public officials, or civil society activists may help identify the information needs and demands of the community, and offer guidance with regard to the implementation of ICM within the particular local context.

- Then, local partners can help engage and mobilize the community to take part in the ICM process, organizing community forums, igniting public interest in the platform, helping recruit community mappers, and supporting them throughout the mapping process.

- After the completion of the map, local partners can serve as its "hosts," ensuring the utilization and further development of the map.

Box 7. Building partnerships in Mathare.

Map Mathare, an interactive community map of the Mathare slum in Naoribi was created by Ground Truth — the team behind Map Kibera. Map Mathare consists of all the major roads and pathways in Mathare, along with its major points of interest — schools, clinics, worship places, markets, business, etc. In the months prior to the official kick-off of the project, the Ground Truth team engaged in an extensive partnership building effort. They met with local youth groups, community leaders, CSOs, and government representatives. As a result, they created partnerships with several local community groups — Community Cleaning Services (CCS), COOPI, and Community Development Center Huruma. These groups undertook the responsibility for much of the ICM outreach efforts, organizing a large "open forum" to present the ICM idea to the community, and helping recruit volunteer community mappers. Nearly 130 Mathare residents attended the "open forum", and between 45 and 70 took part in the training days.

Step 3. Outreach and mobilization

The core of ICM is community engagement and empowerment, and thus local communities should be as aware of the ICM process as possible. Several aspects should be noted in this respect.

- *Infomediaries.* Initial outreach efforts should focus on potential "infomediaries"—local community leaders, social activists, and citizen journalists who could spread the word about ICM, mobilize local residents to participate in the ICM process, and sustain community interest in the process. It is important to identify early on potentially committed infomediaires and keep them as informed and engaged as possible throughout the process.

  - ➢ Infomediaries should be engaged in the organization of community open forums which serve as an effective entry point to the ICM process and help in recruiting community mappers.

- *High profile endorsements.* Public endorsements by high profile community leaders or politicians can be valuable to ignite initial public interest and draw attention to the ICM process.

- *Outreach to marginalized groups.* A special effort should be made to reach out to under-represented and marginalized groups in the community, who can be considerably empowered by participation in the ICM process. It may be particularly valuable to engage young women in the mapping activities, thus offering them skills that can be valuable for their future employment pursuits.

- *Communication of benefits.* Communicating the benefits of ICM in communities with low technological capabilities can be challenging. First, the map is largely available online—and most slum residents do not have access to the internet. Second, slum residents often feel that they do not need a map, as they know how to get around the slum without it.

  It is therefore important to convey to community members the benefits of ICM process, highlighting the importance of acquiring technological skills, placing the community on the map and thus helping improve the provision of public services, and amplifying the digital presence and voice of the community.

- *Persistence.* Outreach and mobilization efforts should not cease once a sufficient amount of community mappers have been recruited. The ICM process should remain visible and welcoming to new participants. A persistent outreach approach is important for two reasons. First, it can help better understand the needs and concerns of the community, and adjust the ICM process accordingly. Further, it can increase the chance that the resulting map will be widely used by the community and other stakeholders.

> **Box 8. Outreach efforts in Mathare.** *In order to strengthen the sustainability of the map and ensure that it responds to concrete needs and demands, the Map Mathare team attempted to hold a constant dialogue with the community. As part of this, the venues of trainings and meetings with community mappers were rotated between different villages, so that different parts of the community would be able to participate, ask questions, and provide feedback.*
>
> *This approach allowed the team of Map Mathare to recalibrate the project according to the demands and needs of the community. For example, as part of the community feedback they received, the Map Mathare team learned that information about water and sanitation issues is important for the community. In response, they created a detailed water and sanitation map of Mathare, focusing on four villages where the need for such information was particularly acute.*

Step 4. Creating an interactive community map

- *Timeline*.

  The timeline for the creation of an interactive community map naturally varies from one community to another, depending on the size of the area, number of participating community mappers, weather conditions, access to the internet, etc.

  > **Box 9.** *In the cases of Maps Kibera, Mathare, and Tandale, the mapping process lasted on average between 3 to 4 weeks.*
  >
  > *The creation of Map Mather took 17 days, with 15 mappers working on average for 5 hours per day. As part of the process, the following data was collected: 750 points of interest; 41.3 km of roads and paths. 24 villages (3 sq. km) and 138 buildings were put on the map.*

- *Technical preparations*.

  The ICM process largely targets marginalized and poor communities, and thus it cannot rely on sophisticated and expensive technological tools. The tool kit for ICM is therefore basic: GPS units; laptops; photo cameras; video cameras; printer/scanner; batteries and chargers; pelican case. The overall costs of such equipment should not exceed $4,000-$5,000. Additionally, it is necessary to find space where community mappers would undergo trainings and work with the mapping software.

- *Obtaining existing imagery and maps*.

  While the ICM process allows to create maps from scratch, relying on existing maps of the terrain may substantially facilitate the mapping process. Before the actual mapping begins, it is therefore important to obtain existing imagery and maps of the area, and structure the mapping process around them.

  > **Box 10. Getting imagery.** *Satellite imagery can be obtained from a variety of sources. In the case of Map Mathare, the American Association of Advancement of Science donated to the team the imagery of the relevant parts of Nairobi. In the case of Map Tandale, satellite imagery was provided by Bing (Microsoft).*

- *Training*.

  The time required for training is typically 2-3 days. As part of the training, community mappers are taught how to use GPS devices, collect and edit geospatial data, use video equipment, and work with the OSM platform and other relevant software. For digital storytelling purposes, community mappers are also taught how to use social media and blogging platforms (e.g., WordPress).

- *Mapping.*

  ➤ *Dividing the area*. The first stage of ICM is deciding which areas will be covered by it and how these areas are organized. This exercise is important for effectively planning the mapping process and assigning each of the areas to community mappers that are most familiar with it.

  > **Box 11. Ensuring representation.** *Many slums consist of villages (Kibera and Mathare are just one example). Determining the location of these villages is important for ICM planning purposes, as all villages have to be represented, and teams of community mappers could be assigned to map their own village – the places they know best.*

  After the mapping area has been determined and divided, a series of mapping and editing exercises can be undertaken.

  ➤ *Ground surveying* – using a GPS device to map roads, streets, and points of interest. As part of this, community mappers are requested to map the relevant areas "with their feet" – collect all geospatial data that they notice around them. The GPS surveying process is complemented by "Walking Papers" – detailed reprints of relevant sections of the existing OSM map. Community mappers use these papers in the field to draw new features, annotate existing data, and take notes that will complement the GPS data and help import it.

  After the completion of ground surveying, community mappers should import the collected data from their GPS devices into the Java OpenStreetMap software, add metadata (e.g., names and descriptions of places), and upload the information to the OSM database.

  ➤ *Tracing satellite images* – relying on satellite imagery to trace buildings and the natural terrain (e.g., rivers, mountains) and uploading them to the OSM database.

  After satellite images are fed into the OSM database, they ought to be corrected and contextualized. As part of this, the satellite images are printed out, and community mappers go from one building to another in the mapped areas, checking and fixing the shapes of the buildings, deleting redundant structures, writing down their type (e.g., brick, corrugated iron sheet, wood stalls) and purpose (e.g., school, private house, local business). A similar operation can be performed with landuse in the mapped area.

  ➤ *Thematic mapping.* Simultaneously to the creation of a general map of the area, community mappers can also collect more detailed and contextualized information

on selected issues of priority. While the general map only provides a general representation of the area, these issues respond to the concrete information needs and demands of the intended users of the ICM.

Box 12. Identifying issues in community forums. In Tandale, a community forum that was held in the beginning of the ICM process revealed that community members were particularly interested in detailed information on the issues of water, health, education, accessibility, and security. The ICM process incorporated these demands, requesting community mappers to collect detailed information about these topics.

Box 13. Thematic data collected on toilets in Mathare.

- *Locations and units: the precise locations of public toilets and the number of individual units attached to them.*
- *Ownership: percentage of private/public ownership, and*
- *Type: percentage of "Asian style" toilets, hanging toilets, etc.*
- *Connection: are the toilets connected to sewage, drain into the river, or have no connection.*
- *Functionability: the amount and location of operational and non-operational toilets.*
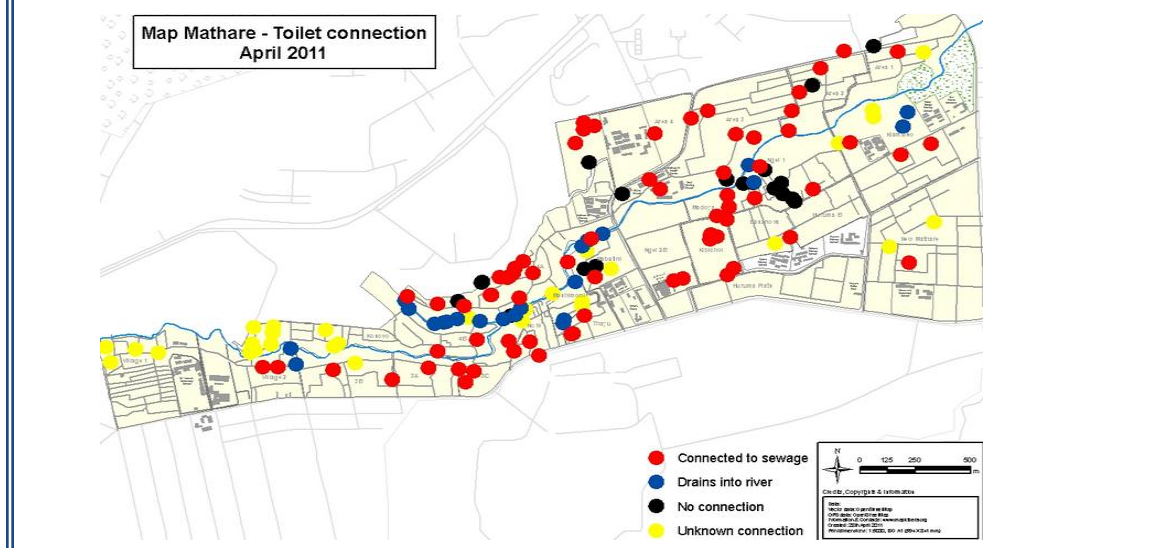
➢ *Story-telling.* The ICM process does not only put the community on a map in the geographic sense. It also aims to empower residents by amplifying their voice and helping them share their news and stories on the map, thus creating a better representation of the community for the outside world.

Community story-telling can happen both during the ICM process and after its completion.
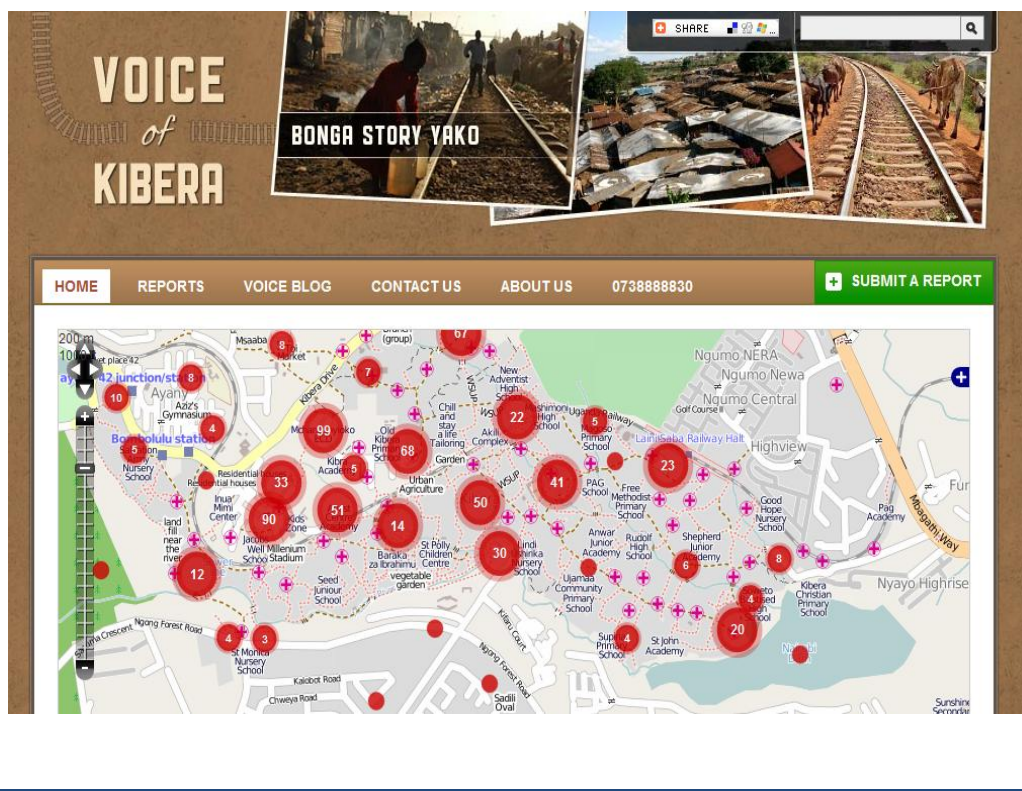
- ▪ As part of the ICM process, community mappers can be encouraged to visually document the places they are mapping. They can talk to other residents and

report current news and events to a designated online platform. These reports can consist of written notes, photos taken with Flip cameras, and videos that represent daily life in the community.

- ▪ The story-telling process can continue after the completion of the formal community mapping. Local residents can be encouraged to share news and reports on a designated website, thus creating a vibrant digital community.

Box 14. Voice of Kibera is an online community information and news platform for the residents of Kibera. It is based on geo-located citizen reporting and contains news stories, photos, videos, and SMS messages sent by residents.

After the completion of the interactive community map of Kibera, the team of Map Kibera established Voice of Kibera to allow local residents to speak for themselves on current events and issues and create a digital community around local information. The website is constantly updated by the Map Kibera team with videos, photos, and stories that represent daily life in Kibera.

Box 15. ICM in Tandale, Dar Es Salaam.

The ICM process in Tandale – an informal settlement of 50,000 residents in Dar Es Salaam, Tanzania – aimed to improve the delivery of public service in the community and amplify the voices of community members. While Tandale's population is rapidly growing, the unplanned settlement suffers from insufficient basic services, such as water supply, drainage systems, schools, and roads. The underlying idea of Map Tandale is that before policymakers allocate resources to improve service delivery in Tandale, they should first understand the needs and concerns of the community from its own perspective. Accordingly, in August 2011, an array of civil society actors, policymakers, urban planners, community members and development partners initiated an ICM process in Tandale with the support of the World Bank.

The Tandale ICM process consisted of 18 community mappers and 25 students from Ardhi Unviersity specializing in urban planning. The mappers and students were divided into six groups of 6-8 people per group, one group for each sub-ward of Tandale. Each team member specialized in one of the following areas: GPS surveying; editing; satellite image tracing; and story-telling.

Map of Tandale, on the first day of ICM:

Map of Tandale, after 10 days of ICM:

➢ *Validating the map.* After the completion of the ICM process, the accuracy of the resulting map should be validated, both to avoid mapping mistakes and to add further context and depth to the geospatial data.

▪ *Physical validation.* In order to further improve the accuracy of the map, teams of mappers may visit again certain locations and correct their appearance on the map.

▪ *Community validation.* This option involves printing out the digital maps created as part of the ICM process and discussing them as part of designated community meetings. This strategy can help improve the map on multiple dimensions: collect additional information about the mapped areas; double-check information that has already been collected; identify missing objects; and encourage storytelling based on the map—discussing problems and brainstorming possible local solutions.
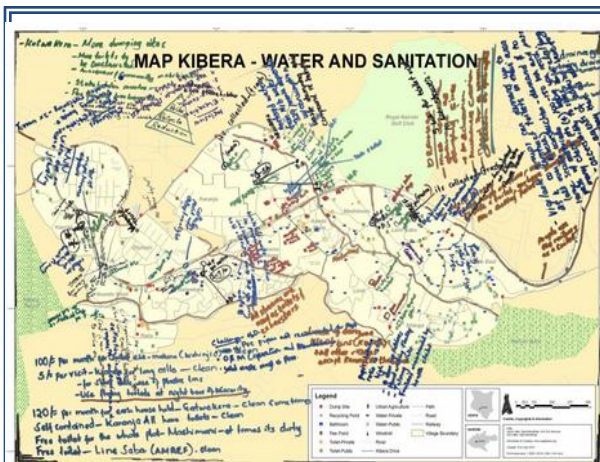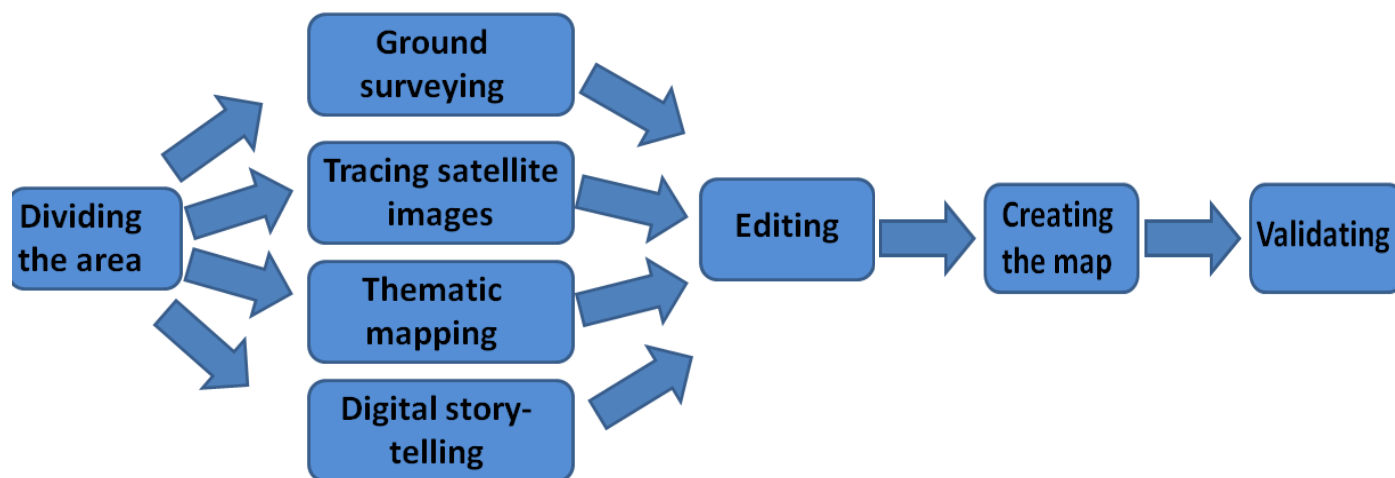

Photo via www.mapkibera.org. A community meeting in Kibera relied on a paper version of Map Kibera to examine the issues water and sanitation in the slum.

The summary of the ICM creation process can be represented as following:

Step 5. Effectively using the map

The ICM can be used in a variety of ways to improve service provision in the community and provide community members a platform where they can articulate their issues and needs. However, the working assumption of the ICM process should be that the map will be used by its stakeholders if it complements their existing strategies and can be seamlessly integrated into their ongoing activities.

- *Existing stakeholders.* In the best case scenario, stakeholders that have been accompanying the creation of the map since its inception will incorporate the map in their activities (e.g., using the information on water and sanitation provided by the map for advocacy purposes, aiming to improve the provision of water and sanitation purposes).

- *New stakeholders.* In order to further broaden the ways in which the map can be used and expand its network of stakeholders, the team leading the ICM process should work with community members, local CSOs, government representatives, and service providers, communicating to them the advantages of the map and its value for the activities.

> *Box 16. Map Kibera and security issues.* After the completion of Map Kibera, its team partnered with UNICEF and several local CSOs that were interested in collecting information about girls' security in Kibera. The community mappers of Map Kibera went again to the field and mapped the relevant data.

- *Tech vs. non-tech uses*. The map should be available in both online and paper version, so that interested stakeholders would not be limited by lack of technological capacity.

  - In communities with low rates of ICT usage, paper versions of the map should be printed out and widely distributed. The Atlas Kibera initiative can be exemplary in this respect (*see Box 2 above*).

  - In communities with high rates of internet or mobile penetration, service provision applications can be created by relying on the data provided by the map. A mobile application can allow residents to track solid waste collection or the supply of water and sanitation services, or report on service provision problems they observe in the community, tagging them to specific locations on the map.

Step 6. Sustaining the map

Sustainability is one of the most challenging aspects of ICM. While a detailed map can be created within several weeks, updating and sustaining the map requires a long-term strategic planning and commitment. While initial mapping efforts are usually supported by development partners and ignite public interest, it may be difficult to sustain this enthusiasm once the map is completed and the external partners leave the community.

- *Relying on existing stakeholders.* The most effective way of ensuring the sustainability of the map is having a local CSO or public officials who would "host" the map, utilize it as part of their daily activities in the community, and further develop. Partnerships with potential hosts should be formed as early as possible in the ICM process, in order to incorporate the particular needs and demands of these stakeholders into the creation of the map.
  - Naturally, some stakeholders are more effective than others. Established community organizations and education bodies, such as universities, are well

positioned to take ownership over the interactive community map and sustain it over time.

> **Box 17. University engagement in Tandale.** *In the case of Map Tandale, Ardhi University in Dar Es Salaam incorporated the ICM process as part of its curriculum in Urban and Regional planning, thus encouraging urban planning students to engage in the ICM process and collaborate with community mappers. This model can be valuable*

- **Identifying new stakeholders.** New hosts for the map can be found after its completion as well. Outreach events should be conducted to present the map to policymakers, community leaders, and CSOs, bringing the existence of the map to their attention and helping them to figure out how to incorporate it in their ongoing community activities.

SCALING UP?

The ICM process is by nature granular and contextualized. It taps the tacit knowledge of local communities and attempts to strengthen the sense of ownership of community mappers over the project. While this approach can be effective on the local level, its translation to the regional or national level is challenging.

There is currently no sufficient experience in this area to offer definitive implementation recommendations. However, the following World Bank-supported practices are exemplary of how ICM can be potentially scaled up.

> **Box 18. Disaster preparedness: Indonesia**
>
> *Various agencies that operate in Indonesia attempt to estimate the impacts of potential disasters (e.g., flooding, earthquakes) on local population and infrastructure. Such informed estimates are crucial for local governments and other stakeholders in preparations for future disasters. The development of these estimates requires accurate data, but access to such data is often limited.*
>
> *The Humanitarian OpenStreetMap Team (HOT) attempts to fill this void, as part of a project supported by the World Bank. HOT leads community mapping efforts to collect exposure data in Indonesia, and attempts to improve the preparedness for emergencies in disaster-prone areas.*
>
> *In urban areas, HOT engages and trains university students to map government offices, fire stations, police stations, schools, sports facilities, health facilities, religious facilities, etc. In rural areas, it works with partners who already work on data collection and mapping, supporting their efforts and training them in OSM mapping techniques. The data collected by HOT is fed into "Risk in a Box" (impact modeling software) to determine the effects of disasters (e.g., flooding) on the mapped communities.*

> **Box 19. The South-Sudan "Mapathon"**
>
> *Lack of accurate maps is one of the problems encountered by the newly independent South Sudan. Absence of geospatial data on basic infrastructure makes it difficult for government, civil society, and development partners to initiate development projects and respond to a variety of development challenges.*
>
> *In April 2011, the World Bank and Google organized a "mapathon," attracting over 60 members of South Sudanese diaspora. Participants learned to use Google's online mapping tool, Map Maker, to map their home regions and add social infrastructure (e.g., schools, hospitals, and local businesses) that they were aware of. This remote ICM is expected to help the South Sudanese government and its development partners improve their provision of public services in the country.*

CONCLUSION

The ICM process offers powerful and unique development opportunities to improve the life conditions of poor and marginalized communities, provide them valuable skills, and amplify their voices. The creation of an interactive community map is, however, only the long path toward improved service provision and empowerment. This note suggests how to design and implement ICM interventions in order to optimize their chances of successfully reaching the end of this path.