

Digital mapping: a silver bullet for enhancing youth participation in governance?

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by LINDA RAFTREE and JUDITH NKIE

Introduction

In 2008, Plan International began work on the Youth Empowerment through Technology, Arts and Media (YETAM) Programme in Mozambique, Kenya and Cameroon with funding from the Finnish Ministry of Foreign Affairs via Plan Finland. The authors were involved as the overall programme coordinator (Linda) and the Cameroon coordinator (Judith).¹

YETAM uses a participatory approach, creating an environment where youth, aged 12–21, can take centre stage in identifying resources, raising issues that affect them, suggesting solutions and acting on them. They use new technology, arts and media as tools to gather information about their key themes. Creating arts and media (videos, paintings, songs, cartoons, photographs and maps) serves as an opportunity

for youth to learn, reflect, build confidence and strengthen communication skills. The ‘products’ youth make are a starting point for involving the broader community, local councils and divisional authorities in dialogue and support for resolving issues that youth identify. Piloting new **information and communication technologies (ICTs)** to better understand their potential to engage youth in community development and governance work is a cross-cutting theme in the initiative. Several ICT tools are used in YETAM, including Flip video cameras, mobile phones for video and photography, the Internet, social media and digital mapping.

ICTs for digital mapping in YETAM

This article is a reflection on the usefulness of digital mapping in particular for engag-

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Photo: Judith Nkie

Youth and staff in Bamessing, Cameroon using a Garmin GPS unit to create a digital map of their community.

ing youth in governance work in Cameroon. It is not intended as a detailed step-by-step description of the mapping methodology or other participatory processes used in the project.^{2,3} Rather, it pulls together thoughts on the usefulness of digital mapping, initial concerns about the technology, incorporating digital mapping into the broader project, digital mapping's influence on local governance – and enabling factors that help make digital mapping effective in youth and participatory governance work.

Youth and participation in Cameroon

Youth make up over 60% of the total population in Cameroon. Between 2005 and 2007, youth unemployment increased from 76% to 82%, with most unemployed youth living in rural areas. In July 2004, a decentralisation policy gave municipal councils the mandate and responsibility for local development and service delivery in the council areas. Municipal mayors, however, often do not have enough information to make good decisions on resource allocation and service delivery to ensure balanced and sustainable development.

Despite the enactment and promulgation of a youth development policy and the institution of youth municipal councils, youth participation in decision-making in Cameroon is still weak, especially amongst the rural population. Most adults do not appreciate young people's views. In the areas where Plan works in Cameroon, youth have restricted access to both formal and informal channels for participation. Initially, we struggled to engage youth in community development processes because the youth had no interest in the adults' agendas and meetings, and were not generally asked for views or allowed to voice opinions.

With the YETAM project, we have seen youth's capacities and confidence grow. They have become more aware of their rights and how to claim them from duty bearers. They develop a high level of interest in using arts, media and new technology for local development planning and to demand and secure their rights from the State. Within the framework of the project, local governments are considering youth as part of civil society and as reliable development partners. Youth now

² For detailed information on the digital mapping process, see Kunbega (2011).

³ For information on the other participatory tools and overall methodology used in the YETAM project, see Raftree (2010).

participate in the decision-making process, budget allocations and development activities and are creating accountability mechanisms with their local traditional councils and the municipal councils of Ndop, Okola and Pitoa. Community leaders, district and national level authorities and Plan are more aware of issues that the participating young people are most concerned about.

Why digital mapping?

For centuries, maps of Africa have been made by outsiders to stake claims and territories. As the Internet becomes a primary source of information, we see a similar digital scramble for Africa. Corporations compete to market their products and services to the 'base of the pyramid'.⁴ Large technology companies and donors want to be the ones to stamp their logos on digital maps, mapping software and mapping platforms in Africa, a continent that is still yet to be fully mapped digitally. One could argue that a community has a right to be included 'on the map' and a right to map itself, in the same way that youth and communities have the right to tell their own stories in their own voices, rather than having an external, often foreign or urban outsider, telling a story about them and owning the rights to it afterwards.⁵ A community has the right to decide what it wants to map. Open digital mapping can offer a new kind of voice and ownership to traditionally excluded groups.

Hand drawn community mapping has a long history in the field of participatory development as a way to gather the community to discuss priorities, enhance ownership and plan actions.⁶ Digital maps can complement hand drawn maps and are easily shared at wider levels. Small rural communities in the US and Europe appear

in online maps in great detail. Most rural communities in African countries, however, are simple dots on a map in the middle of a blank screen, with no information or detail. Digital maps from rural communities could contribute to the growing body of global geographical information.

Digital mapping can offer youth a tool to collect and process information, and to advocate for their concerns with their local governments. It can provide youth with a means to:

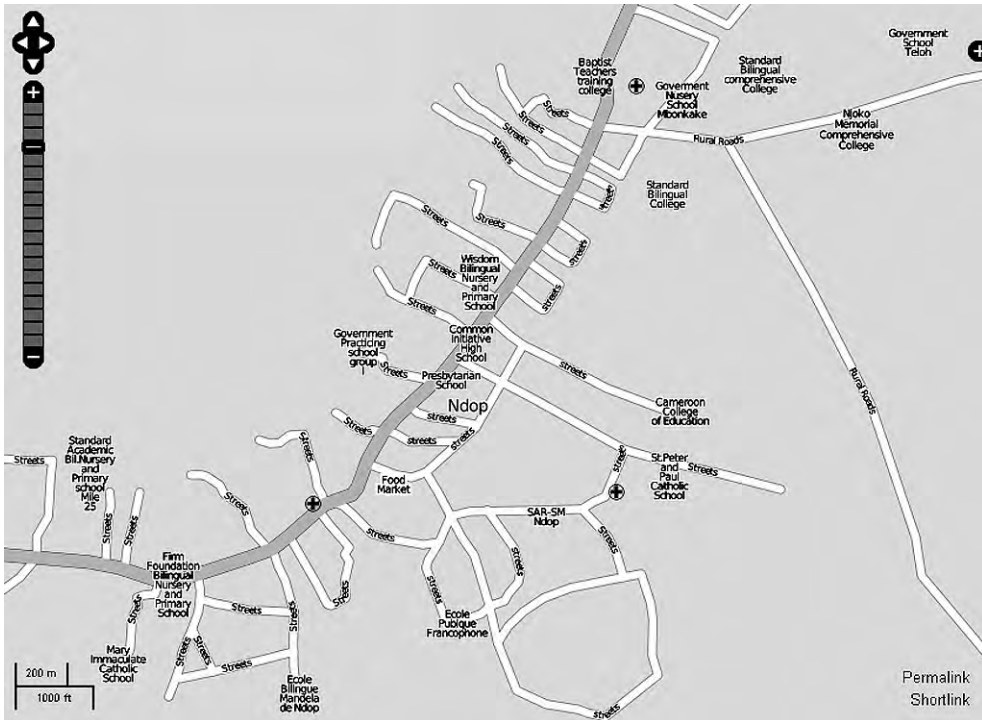
- research, analyse and own their community information;
- map their communities in ways that make the most sense to them;
- decide what deserves to be mapped and what doesn't and what should remain unmapped; and
- engage communities and authorities in discussions around resources and risks.

Digital maps reach far beyond the community. They help make those who are often excluded visible to the broader world via the growing online population. There is a wealth of information that exists offline – consider all the hand drawn maps that exist in communities worldwide – which could be of great interest to the wider world if digitally shareable. Digital maps could support work in disaster and risk reduction, crisis and conflict management and help achieve more equitable resource allocation and support from governments and external agencies. Digitising hand drawn community maps could make them easier to update on a regular basis and allow local maps to be joined up online to create a clearer picture of the world. Coupling geographical information with data offers a more objective way of looking at population and resources. Youth and communities can use that information to,

⁴ According to Wikipedia, 'in economics, the bottom of the pyramid is the largest, but poorest socio-economic group. In global terms, this is the 2.5 billion people who live on less than \$2.50 per day. The phrase "bottom of the pyramid" is used in particular by people developing new models of doing business that deliberately target that demographic, often using new technology. This field is also often referred to as the "base of the pyramid" or just the "BoP".'

⁵ Also see Rambaldi *et al.* (2006).

⁶ Also see Mascarenhas and Prem Kumar (1991).



Above: Ndop after mapping (Source: OpenStreetMap.org).
Right: Ndop before mapping (Source: Google Maps).



for example, challenge a politician's politically motivated intention to build infrastructure in one area versus another.

Proceeding with caution

It's easy, however, to get caught up and excited about innovations, to think that technology is a silver bullet that will magically resolve things.⁷ There is a risk that we lose sight of the bigger goals – youth engagement and improved governance. So we needed to consider a few things before proceeding.

Purpose and motivation

Do we have a clear enough purpose for making a digital map? Will this just be an interesting exercise for our organisation and for people interested in innovations and ICT4D? Will the maps end up being something potentially fun, novel and excit-

ing for the youth, but without real impact in the end?

Information

Is this information already accessible through existing channels? Is availability of information the issue or is it something completely different? Will information in this format be useful for the youth and communities? Is it different or better than information they've had access to before?

Mandate

Whose mandate it is to collect this kind of information? Why should communities,

⁷ For a discussion of some of the questions revolving around participatory digital mapping versus hand drawn mapping, see 'Is this map better than that map?' Linda Raftree (2009).

NGOs, technology volunteers or specialists collect it? Are we replacing government functions?

Access

Will digital mapping be useful in communities without regular Internet access? How will we ensure that the information is accessible to communities for decision-making?

Sustainability

Will it be a one-off exercise? Will youth be able to build necessary skills to create maps and keep them updated? What type of support will they need in the long term?

Risks

Will there be questions and concerns about why the youth are engaging in digital mapping? Will political leaders welcome the youth's possession of this information or could it be threatening to them? Will we raise any expectations that cannot be fulfilled later? Who are we excluding from the process?

Doing our research

In order to think things through, we read lots of blogs and discussed with other groups and individuals to see what they had accomplished.⁸ We learnt more about possible tools and methods. We liked the principles behind Open Street Map (see Box 1) – free, open source tools and a global map platform that anyone can contribute to, that is not 'owned' by anyone, which could give communities power to put their own information out to the world.⁹

Box 1: What is OpenStreetMap?

OpenStreetMap is a free editable map of the whole world. It is made by people like you. OpenStreetMap allows you to view, edit and use geographical data in a collaborative way from anywhere on Earth.

There are no restrictions on **who** can use the data. Individuals, clubs, societies, charities, academe, government, commercial companies. When we say everyone, we mean everyone.

There are no restrictions on **where** you can use the data. Privately or publicly. Commercially or non-commercially. Paper maps, electronic maps, books, newspapers, TV, gazeteers, search systems, routing, games... or indeed anything you can think of that will surprise us.

Source: www.openstreetmap.org

Box 2: How does a global positioning system (GPS) work?

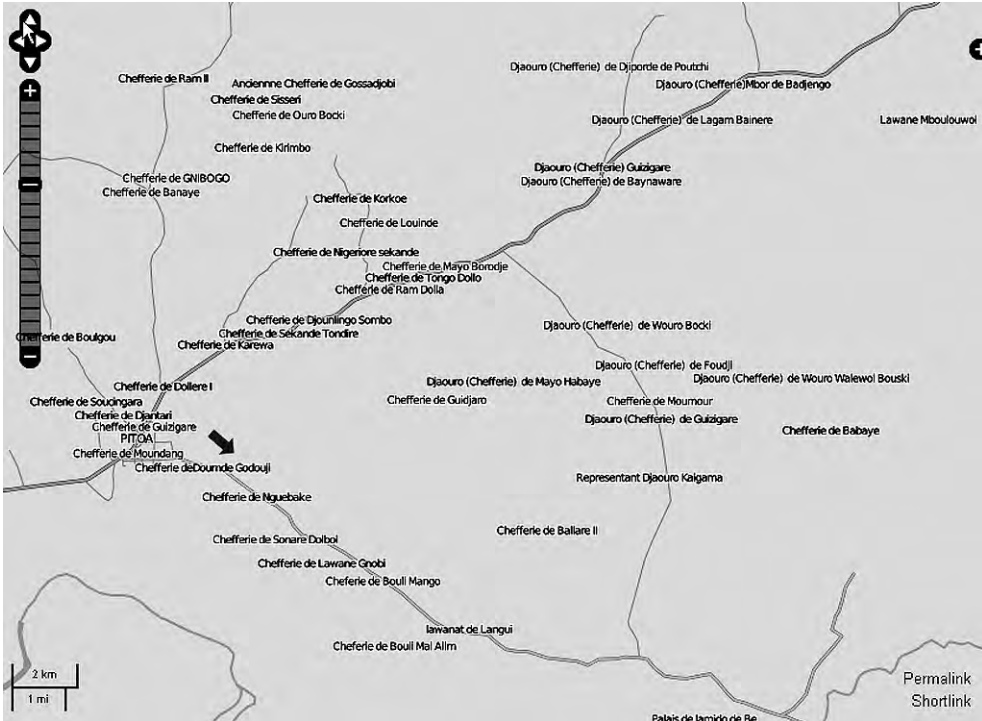
A GPS unit allows a person to geographically track their movements. A person carrying a GPS unit and walking the border of a community would be able to 'trace' an outline of the community. The person could also trace roads and mark other types of features of the community using the GPS unit. These are called 'traces'. This information is used to create a **base map** including village boundaries, roads and footpaths, rivers and streams etc.

In addition, 'waypoints' are collected, meaning that a person stops at a particular location and presses a button on the GPS unit to mark the exact location: e.g. a school, mosque, hospital, well, or other important feature. All these 'traces' and 'waypoints' are stored on the GPS in the same way that photos are stored on a digital camera, and then, like one does with the photos on a digital camera, they are downloaded onto a computer for further processing.

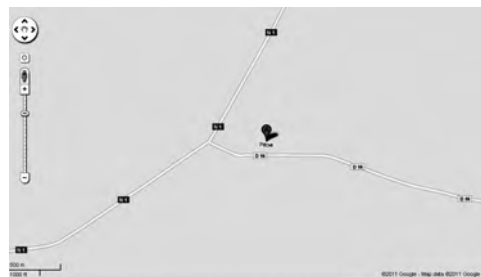
Additional **data** (e.g. number of boys and girls at a school) can be collected and attached to waypoints, and thereby 'geo-located'.

⁸ We acknowledge Anthony Njoroge, Sammy Musyoki and Salim Mvurya from Plan Kenya; Pedro Miambo from Plan Mozambique; Mikel Maron, Erica Hagen, Jamie Lundine and Primoz Kocovic from Map Kibera and Ground Truth Initiative; youth and community councils from Ndop, Pitoa and Okola; PAVIS (Partner Vision), IRONDEL and STA (Solutions Technologiques Alternatives), our partners in Cameroon; Jeff Warren from Grass Roots Mapping and Leo Burd at MIT's Department of Play; Erik Hersman, Juliana Rotich and Patrick Meier at Ushahidi; Ken Banks and Laura Hudson Walker at FrontlineSMS and Josh Nesbit at Medic Mobile; and Ernest Kunbega for helping us to think through the idea of mapping. For more information and discussion on digital mapping, see the resources at the end of this article.

⁹ Open source software (OSS) can be defined as computer software for which the source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition. This permits users to use, change and improve the software and to redistribute it in modified or unmodified form. It is very often developed in a public, collaborative manner. OSS are typically free-to-use. Often, open source is an expression where it simply means that a system is available to all who wish to work on it. Source: Wikipedia.



Above: Pitoa area and the local chefferies (local chief's palaces) mapped by youth.
Source: OpenStreetMap.org.
Below right: Pitoa before mapping.
Source: Google Maps.
Right: Pitoa after mapping by local youth.
Source: OpenStreetMap.org.



After a long thought process about the pros and cons of digital mapping in the context where we are working, we decided to pilot OpenStreetMap to see if it was a useful tool in the broader toolkit of participatory methodologies with youth.

Incorporating mapping

We purchased some GPS (global positioning system) units and hired Ernest Kunbega, a local expert on geographical information systems (GIS), to do three four-day theory and practice workshops with youth, partners and the communities to produce digital maps for Ndop, Okola and Pitoa in Cameroon.

During the theory sessions, the groups discussed what information would be useful for mapping their key concerns: violence and gender-based discrimination.

These two themes had emerged strongly from youth in the three participating countries over the past two years during different prioritisation exercises, and were the primary topics the YETAM programme

Photo: Judith Nkikie



During training in Okola, Cameroon, youth learn how to use GPS units to trace roads and boundaries and pinpoint structures such as schools and wells to create a community base map with geographical features.

aimed to address. After learning more about what mapping could do, the youth also decided to collect information around existing resources so that they could bring the maps to the local service providers, municipal councils and traditional authorities and discuss allocation of resources.

They created a worksheet outlining all the information they wished to collect, such as primary and secondary schools enrolment, number of boys and girls at school, number of school benches, teachers, student/bench ratio, student/teacher ratio, grades, health facilities, number of doctors and nurses available, beds, malaria and HIV rates, facilities such as pharmacies, number of consultations at health centres per month and local recreational facilities.

An authorisation letter was obtained from the divisional officer for youth to collect waypoints and tracks. This allowed the youth to explain to the officer what they were doing and gave them a letter to show anyone who mistrusted their motives or those who requested a bribe to give the

youth information. Based on the hand drawn maps from earlier in the process, the youth created a work plan and divided the work. Each group had a codification sheet and waypoint form indicating the information they would collect. The data collection was done by the youth under supervision of Plan staff, a consultant and partner for one week covering all the communities of the council area. Only 10 GPS units were available so just 20 youth per council area were able to collect field data. The youth were shared in five groups of four with two GPS units each. The youth tracked roads and categorised them, collected waypoints of socio-economic infrastructure and built a database using the information.

After all the information was collected, the youth worked in small groups with the consultant to download their information onto computers using Garmin Map Source (an application that makes the GPS information usable on the computer) and to upload it onto the OpenStreetMap website.



Photo: Judith Nkie

Okola youth using a codification sheet and waypoint form to record geographical information. Additional data can also be collected and attached to these 'waypoints' and thereby 'geo-located'.

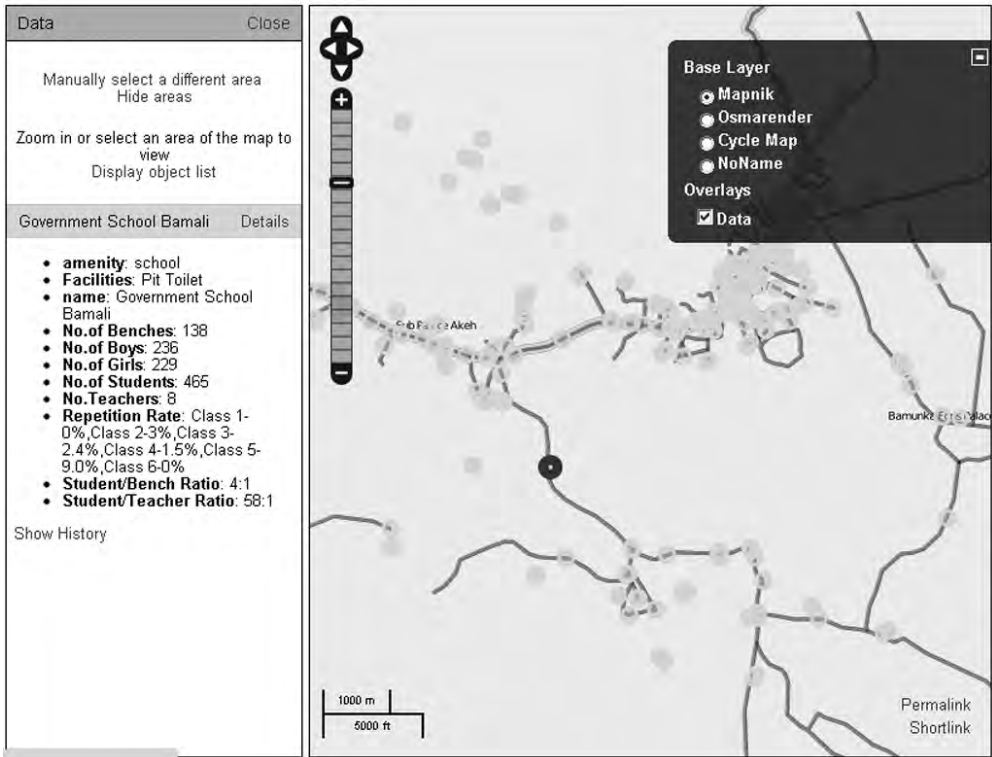
Once the maps were completed and available online with their associated database, the youth of Ndop and Pitoa presented them to councillors and local leaders, who were amazed at the information. Councillors acknowledged a bias – that they have been allocating resources to more accessible communities and where there are influential leaders.

As a result of the exchange with decision makers, youth were invited to the annual budgetary sessions at the development union level, where stakeholders deliberate projects and vote on budgets. The councils also invited the youth to join discussions on the overall council budget. Two of the youth community action projects were funded, along with a large water project for which the youth had advocated.

Did digital maps influence decisions of community authorities, councils and local government?

The digital maps produced clearly show the social amenities and socio-economic infrastructure (schools, hospitals, water points, administrative buildings) that are found in the respective council areas and communities. They have generated useful socio-economic data that the council can use in strategic planning. In the course of producing the digital maps, youth are exposed to the realities of their council areas and build relationships with local council members who have begun to see youth as having worthwhile ideas, skills and opinions.

The mayors of municipal councils like the idea of making the maps and visualising resource allocation. It is their mandate to collect data and produce monographic studies of their respective council areas, yet in the past they have not done this digitally. They feel the absence of updated information (specifically 'digital maps') affects their planning and allocation of resources,



The youth collected waypoints which are geographically linked to corresponding data. Here the information shown on the left-hand side is about the government school in Bamali. Source: Open Street Map.

resulting in some communities having little or no social amenities whereas others are overdeveloped. The community council and local governments are now working closely with the youth during the planning process and budgetary sessions to prioritise children’s and youth’s rights. They now allocate projects and resources to particular communities based on the information analysed from the digital maps to ensure balance and sustainable development. The councils are ready to support the youth financially to use their expertise to continue updating the information on the digital maps.

Community councils and local governments are also using the digital maps to share information about their area with other leaders, stakeholders and international bodies via the web. The database presented on the digital maps by the youth has facts and figures which are used by the community council, local govern-

ment and youth themselves to analyse issues with regards to children’s and youth’s rights. Youth feel that the digital maps help to connect the community with the rest of the world in a modern and ‘civilized’ way. They feel that hand drawn maps are indeed important, but have several limitations – they do not provide facts and figures attached to geography – to ‘place’ – that the youth can use during the planning process. Information on hand drawn maps cannot be updated, meaning new maps have to be drawn to show changes in the community.

If digital mapping is to be effective...

Digital mapping cannot be seen as a stand-alone activity. It sits within a broader methodology of youth involvement and engagement with community adults and local leaders. Simply having a map does not accomplish anything on its own. To help build support for the map at local and

municipal level, there needs to be an ongoing process of dialogue and relationship building, and youth need time to build their own skills in various areas. Youth need to be present as representatives and their voices heard in all the forums of community councils and local government for dialogue and to pass on their message. Youth also need to be given the chance to take leadership positions or frontline roles in activities which concern children and youth.

The results so far achieved can be related back to the digital mapping exercise. But they also have much to do with the solid foundation of relationships that were built during the first phase of the project and the work with the other participatory elements of the programme, including:

- hand drawn mapping;
- prioritisation exercises;
- youth-led research through community interviews and participatory video; and
- community engagement through schools and local traditional councils.

The youth and community councils worked side-by-side on the other programme activities, even before the digital mapping exercise began. Adults were well aware of why the youth were making the maps and supported the youths' involvement.

If Plan continues with mapping, we need to consider several aspects. Although half the youth say they feel confident using digital maps, the other half report having only theoretical ideas on digital mapping because they have not been exposed to facilities (computers and the Internet) that would enable them to use digital maps. Having too few computers and GPS units and irregular and slow Internet connections make it difficult for youth to visualise the digital maps and extract the necessary information needed. The youth have said that they do not have adequate knowledge to keep the information updated on the maps without outside support.

In addition, students with lower

education levels have a harder time mapping. The 10 out-of-school youth who participated felt their role was limited due to their education level (however six of them were motivated to enrol in school again to catch up with their peers). Programme coordinators need to insist that equipment is shared equally among the group, who are mixed in age and gender. Over time, as girls and younger youth have become more adept and secure, they have started to demand to use the equipment. Language and literacy can also be limiting factors as the software is only available in main languages like English, French and Portuguese. In addition, mapping requires a certain amount of conceptual spatial thinking and some children, youth and less educated adults can be left behind in the process.

We also need to ensure that the information collected gets back to those who provided it, especially the remote communities that have already been left out by the councils. This means that mechanisms to share it in easily understandable formats need to be identified. Sustainability also needs to be considered so that maps remain updated and so that the promises of the authorities are followed up on and they are held accountable for them.

What's next?

We will work to add another mapping software to the process so that the information gathered can be better visualised on the maps that the youth created. We will also work with the youth on using digital maps to track and report cases of violence against children and gender-based discrimination – and to use the maps to advocate for responses to these problems. We also plan to work toward overcoming some of the challenges mentioned above to ensure that the maps are continually updated, useful and accessible to the youth and communities and so that decision makers are held accountable for keeping their promises.

Once we feel certain that the methodology is useful, we hope it can be integrated into our working methodology with youth and communities across all the areas where we work and into Plan's global community development planning methodologies. Although the youth in school find this technology very exciting and innovative, the community component of the YETAM methodology needs to be boosted to give more opportunity to non-schooling youth to contribute, and ways of involving remote communities need to be found.

Conclusions

Digital mapping was an exciting element for youth, communities, staff and local governments. The tool attracted attention and interest, and served to gather and provide detailed information on development indicators in a new format, which brought positive initial results and outcomes. However, the success of digital mapping as a tool was closely tied to the other elements in the programme: skill building, effective communication, community organising, trust-building among youth and decision makers and using participatory methods to rank and prioritise issues of importance to youth.

Digital mapping would not have come far without these other programme elements. Continued success will rest on

the longer-term engagement of the youth in the process. Follow-up by youth, staff and partners needs to continue to hold governments accountable for the initial actions and decisions they have made.

The advent of the Internet coupled with the ubiquity of mobile phones and other lower-cost technologies has created the idea in the minds of some that if only people at the 'base of the pyramid' had access to a technological solution, development would magically happen. There is the notion that people just need a mobile phone and they will access the market. Youth just need a computer centre and they will be able to find jobs. Children just need a laptop and learning will take place. As attractive as these ideas are, they are generally false. Underneath successful information and communication technology for development initiatives are other, deeper core processes such as behaviour change, community engagement, skills training and community organising. It is easy to get swept away with exciting new tools and technologies rather than stepping back to see what is actually to be accomplished and considering all the possible ways of doing it. A multitude of tools, methodologies and 'solutions' can be used to achieve a goal, but the critical thing is to find the right combination of tools and solutions for the complex contexts in which we work.

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