Holding a National Summit to Improve Health Outcomes through Health and Mapping Sector Collaboration in the Development of National Geospatial Data Infrastructure: The Nigerian Strategy

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Abstract. The use of geographic approaches in improving health outcomes, including the fight against Human immunodeficiency virus infection / acquired immunodeficiency syndrome (HIV/AIDS), is increasing; however, health ministries, AIDS coordinating agencies, and other social service ministries often lack the capacity to use geospatial data and tools such as geographic information systems (GIS). Health organizations would benefit from building collaborative relationships with national mapping agencies (NMAs), national geospatial data infrastructure (NGDI) coordinating bodies and in-country stakeholders with GIS capacity to enhance decision making for health sector programmes and to create an action plan to help address identified challenges.

One approach for strengthening the NGDI within the nation's health sector was the two-day Nigeria Health and Mapping Summit of 2011. The summit provided opportunities for stakeholders in the NGDI and health sectors to discuss strategies for sharing geospatial data and building capacity to support national health endeavours.

This paper provides a description of the summit and offers lessons learned on key aspects of the event, including the post-summit communiqué presented to both executive and legislative arms of the government with the intent of improving the NGDI. This paper also discusses progress on health and mapping sector collaboration and coordination since the summit.

Keywords: national geospatial data infrastructure, NGDI, NSDI, Geospatial, GIS, health, mapping, stakeholders, collaboration, Nigeria

1. Introduction

Geospatial data provides valuable context when addressing health issues. In the context of social services, including the health sector, geospatial data and maps can be important tools to direct interventions, shape policy and empower communities [1-3].

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Unfortunately, as a result of the significant constraints to development of health information infrastructure faced by many countries[4], health ministries, AIDS coordinating agencies, and other social service ministries often lack the capacity to use geospatial data and tools such as geographic information systems (GIS) for improving health outcomes[5-6]. These organizations can benefit from building collaborative relationships with national mapping agencies (NMAs), other national geospatial data infrastructure (NGDI) coordinating bodies and existing in-country stakeholders with GIS capacity to enhance decision making for health sector programmes and to create an action plan to help address identified challenges. In Nigeria, the development of NGDI and the application of GIS—which are essential for mapping—are central to the Nigerian effort to eradicate poverty; achieve food security; fight diseases such as malaria, tuberculosis and HIV/AIDS; reverse environmental degradation and increase the pace of industrialization[3]. The Nigeria Health and Mapping Summit of 2011 supported this effort and fulfilled one of the 2009 recommendations of the Committee on Development Information, Science and Technology (CODIST-I) from a workshop held in Addis Ababa, Ethiopia. The workshop attracted 188 participants from 36 countries, including 14 participants from Nigeria. As a result of the meeting, the United Nations Economic Commission for Africa (UNECA, www.uneca.org) member states approved resolutions calling for improved cooperation and collaboration between the health sector and NMAs, including ensuring that key players in the health sector— ministries of health and social services as well as national AIDS commissions— actively participate in NGDI efforts.

The Nigeria Health and Mapping Summit of 2011 allowed attendees to identify the primary issues affecting efforts to improve health outcomes as well as opportunities to improve coordination and collaboration of efforts. A post-summit communiqué, which contained resolutions and action items, was presented to the executive and legislative arms of the government and other stakeholders with the intent of improving the NGDI needed to combat HIV/AIDS and related health and social service challenges. The Nigeria mapping summit is expected to evolve into a regular event that can serve as a model for other countries to follow.

Based on the length of time required to obtain stakeholder concurrence for an official summit report, publicizing the results of the summit has been a slow process. To help reinvigorate the discussion in Nigeria and in other developing countries about the need for health sector involvement in NGDI development, this paper provides a description of the summit and offers lessons learned on key aspects of the event, such as how the event was organized and the involvement of collaborating agencies, a steering committee, and participants, as well as the role of a summit communiqué. The paper also discusses key summit results and describes progress on health and mapping sector cooperation since the meeting.

2. Rationale for a Health and Mapping Summit

Ministries of health (MOHs), national AIDS commissions (NACs), and other social service agencies that wish to use GIS data, tools, and methods are often hampered by a lack of familiarity with and/or access to GIS resources within their country. This lack of familiarity and/or access, which is symptomatic of the many barriers to health

systems strengthening experienced in developed and developing countries [4], creates a GIS capacity gap within the health sector which makes it difficult for the health sector to leverage the power of geographic data, software, and analytical techniques to strengthen the evidence base for decision making.

Many countries already have an NGDI program in place through which the NMA and supporting mapping sector organizations can assist health sector organizations and stakeholders who are seeking to use GIS to enhance their efforts in evidence-based decision making. Often, however, the lines of communication and cooperation between the health and mapping sectors are not clearly established.

To provide an example of how to bridge the divide between the health and mapping sectors in a country as a means to improve national health outcomes, especially with respect to HIV/AIDS, in October 2011 the Federal Government of Nigeria (FGN) collaborated with MEASURE Evaluation, with support from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the U.S. Agency for International Development (USAID), to hold a summit between the health and mapping sectors both within and outside the public sectors. Beyond helping to improve collaboration and coordination among stakeholders in the health and mapping agencies in Nigeria, the intent of the meeting was to serve as a reference point or a model for making recommendations to other countries who might be interested in holding a similar event to promote the development of collaborative partnerships to improve health outcomes.

As NGDI agencies are responsible for creating and maintaining many of a country's geographic data sets, strong linkages between NGDI actors and social service ministries—including health—can ensure that the most recent geographic data are available to inform program planning. In turn, health ministries can share their data with NGDI agencies so that health and social service data inform program planning in other sectors. This multi-sectoral awareness ensures that health and other social service issues are considered in other programs, such as water resources, environment, agricultural and economic development, and vice versa.

Nigeria was well-suited to hold such a national meeting as a result of its robust NGDI program, as well as the presence of regional centres of excellence in GIS (e.g., the Regional Centre for Training in Aerospace Surveys or RECTAS). In addition, NGDI representatives from Nigeria at the 2009 CODIST-I workshop in Ethiopia had expressed a desire to expand cooperation with the health sector for the development and sharing of spatial data.

Nigerian ownership and leadership of the summit was ensured by the establishment of a summit steering committee (chaired by the coordinator of the NGDI programme in Nigeria) and the active participation on this committee of key health and mapping agency representatives of FGN. Committee members from the health sector were high-ranking officials from the HIV/AIDS Division of the Department of Public Health; Department of Health Planning, Research and Statistics (DHPRS); National Health Insurance Scheme (NHIS); and National Primary Health Care Development Agency (NPHCDA). Mapping sector representatives were key decision makers from the Office of the Surveyor General of the Federation (OSGOF), National Population

Commission (NPopC), National Space Research and Development Agency (NASRDA); and RECTAS.

3. NSDI/NGDI Organizational Framework in Nigeria

Nigeria has taken steps towards establishing a formal NGDI development program. The NGDI in Nigeria is being developed and coordinated by the National Space Research & Development Agency (NASRDA). NGDI organisational and technical structure has been a subject of major discussion[7-9]. The NGDI will include a metadata catalogue describing the geospatial holdings within the country; storage capabilities to house significant quantities of geo-information; mechanisms to enable timely access and sharing of the holdings; and tools to enable analysts and key government agencies and regional governments within the country to use the NGDI holdings to address issues related to sustainable development, including those related to health, infrastructure, security planning, disease control, environmental monitoring, etc.

Central to the NGDI is a spatial data clearinghouse that contains the overall network's spatial metadata with linkages to each remote node (figure 1). The clearinghouse is being hosted at NASRDA's Digital Databank and Library building. Each remote node represents the sectoral ministries and agencies, such as health, education, agriculture, and transport among others. The remote nodes are located at various government ministries, and linked to the clearinghouse through a combination of new and established communication links inclusive of both wired and wireless means.

As with other spatial data infrastructure patterns, this is accomplished using a centralized metadata database that takes full advantage of a variety of discovery and publishing mechanisms to index content throughout the NGDI network[10].
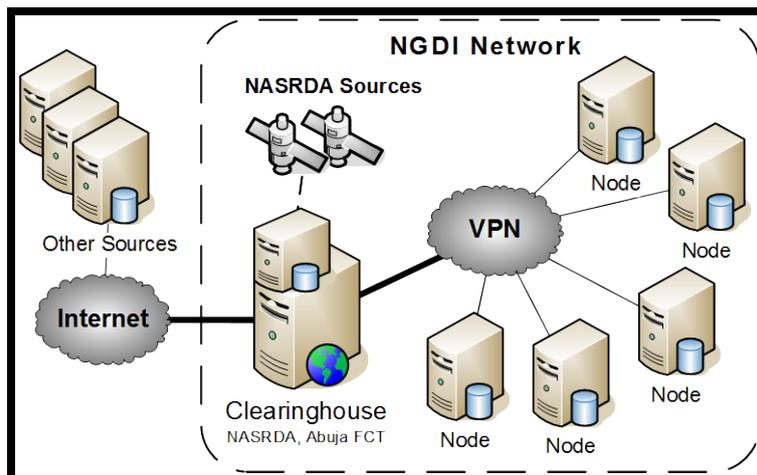

Figure 1. The NGDI network supports distributed holdings with a common clearinghouse[10].

One of the key elements in establishing a formal NGDI is the need to establish partnerships among stakeholders to promote sharing of data, technical resources, and expertise. Inclusion of stakeholders' input is an integral part of the process, and one of the significant outcomes of the Nigeria Health and Mapping Summit of 2011 was the recognition of the Federal Ministry of Health as an NGDI node.

4. The Health and Mapping Summit

In Nigeria, as in some other countries in Africa, the responsibility for producing and maintaining spatial data is spread across multiple ministries and agencies. In other countries, however, spatial activity is centralized. Regardless of the number of players, typically one entity, the NMA, coordinates the NGDI process in those countries. In most cases, the NMA is the institution in charge of leading the NGDI process, although this might vary from country to country.

While the NMA may coordinate NGDI efforts, there are multiple groups representing a variety of interests, both in the public and private realm, contributing to the NGDI. Likewise for health, the Department of Health Planning, Research and Statistics is typically responsible for overseeing the national health information system. However, many other departments are involved, such as the National Primary Health Care Development Agency, Department of Public Health, and National Health Insurance Scheme, as well as implementing partners, nongovernmental organizations (NGOs), and the donor community. The Nigeria Health and Mapping Summit of 2011 provided a unique opportunity for representatives from these realms — NGDI and the health sector, especially HIV/AIDS — to explore opportunities to strengthen the NGDI.

The conference, which drew over 120 participants from the health and mapping sectors, including implementing partners, training institutions, the National Planning Commission, and the media, sought to initiate a pan-Nigeria community of practice to increase involvement of the Nigeria Federal Ministry of Health in the NGDI process and to build linkages between these health sector agencies and NGDI actors, including NMAs.

The summit's focus to achieve dialog among stakeholders from the health and mapping sectors and to help establish partnerships has led to greater awareness and sharing of geospatial resources and to the establishment of the Federal Ministry of Health (FMOH) as an NGDI node. Both developments will help build capacity within the health sector and ultimately strengthen the NGDI in Nigeria.

4.1 Organization and Execution of the Summit

The approach used in the planning, organizing and execution of the Nigeria Health and Mapping Summit of 2011 ensured that the process (1) was owned and led by the country; (2) encouraged partnerships and collaboration among relevant stakeholders; and (3) promoted participation and allowed for consensus building. From the conceptualization to the hosting of the summit required approximately 14 months. The relatively slow pace at which the summit planning unfolded can be attributed in large

part to the deliberate process required to gain buy-in and build consensus among major stakeholders. For example, gaining consent from all organizations within the FMOH required almost eight months as a result of the need to ensure intra-agency collaboration within the ministry.

The approach adopted in the planning and organization of the gathering ensured that the process:
- was country-led and country-owned through setting up of a steering committee to drive the planning, organization, and setting of conference agenda items;
- included a concept paper on the background, objectives, and outcomes, as well as benefits to the country, to be derived from the conference;
- was participatory, reflective, and allowed for consensus building;
- shared existing efforts and opportunities for collaboration;
- ensured political commitment and buy-in of highest government decision-makers;
- identified local capacity needs; and
- developed a communiqué to summarize the achievements of the conference, as well as commitments for the future.

The approach used for the execution of the summit can be grouped according to the three phases of the summit process: before, during, and after.

4.1.1 Before the Summit: Buy-in from Stakeholders

Gaining the buy-in of key stakeholders is an essential element for success when organizing a collaborative summit within the context of social service and mapping organizations. In Nigeria, buy-in of stakeholders was initiated by a local champion who spearheaded the effort until a steering committee could be formed to assume that role. The buy-in included stakeholders in the widest sense of the word: policy makers, public sector, sponsors, users and private sector, as well as support organizations that have a stake in the outcomes of the summit. The more stakeholders feel they have been involved in the process, that their views have been considered and that their needs have been addressed, the more likely they will be to support the summit and to work toward its fulfilment.

To maximize the win-win benefits of engaging key stakeholders, it is important at the beginning to build a working relationship based on respect for their time and effort. Expecting a busy stakeholder to participate in a poorly planned meeting, or to travel a great distance with little advance notice, is not likely to achieve a positive result[5].

4.1.2 Before the Summit: Formation of Summit Steering Committee

Based on a recommendation from stakeholders during the consultative and buy-in period, a summit steering committee was established. The committee consisted of representatives from both the health and mapping sectors. The key role of the steering committee was to oversee the planning, organizing, and implementation of the Summit activities as well as to ensure follow-through on the summit resolutions and recommendations.

The steering committee consisted of nine members drawn from government agencies that played lead roles in health and mapping activities within the country. MEASURE Evaluation served as the secretariat for the committee and functioned primarily as a facilitator of the process. A chairman was selected to coordinate and lead the business of the committee. The selection of the chairman was guided by the need to balance NGDI development expertise with strong leadership ability.

4.1.3   During the Summit

The FGN collaborated with MEASURE Evaluation, which is funded by the U.S. Agency for International Development (USAID), to organize the Nigeria Health and Mapping Summit of 2011. The conference was the first of its kind at the country level in Africa, as it marked the first time government representatives from the health and mapping sectors have met on such inter-ministerial or agency levels to harmonize national efforts to improve health outcomes through more effective leveraging of the NGDI.

In addition to opening remarks and a keynote address, there were technical sessions focused on the identification of challenges to geospatial resource sharing, and there was a breakout session of group work to prioritize those challenges and to recommend solutions. The two-day event was divided into an opening ceremony, two
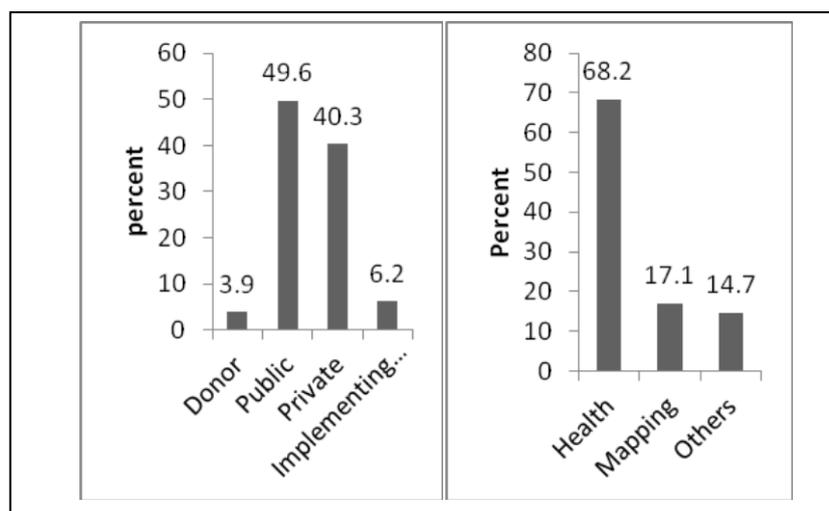
Figure 2. Percent of summit participants by sector (health, mapping, others) and by type of organization (donor, public, private, or implementing partners); by gender, about 74% were male.

technical sessions, and breakout session for group work. The opening ceremony provided opportunities for policymakers and government functionaries (executive and legislative) to declare their support and make goodwill messages in support of the summit.

In terms of fulfilling the objective of bringing together participants from throughout the NGDI community and the health sectors in Nigeria, there were

attendees from both the health and mapping sectors; and also both public and private organizations were well-represented (figure 2).

4.1.4   During the Summit: Technical Sessions

The technical sessions were of two tracks: the first track devoted to presentations by health organizations on geospatial resources maintained versus needed, as well as top NGDI challenges affecting their work; and the second track centred on presentations by national mapping organizations concerning the geospatial resources available to assist the health sector (data, software, hardware, technical expertise, training, etc.). Discussions were focused on current or upcoming projects and on the geospatial resources that will be developed or needed to implement the projects, including opportunities for collaboration and top NGDI challenges affecting the organization's ability to work effectively with the health sector.

4.1.5   During the Summit: Breakout Sessions

The second-day technical session included a breakout session of facilitated discussion to prioritize the challenges to geospatial resource sharing and development of NGDI touched on in the technical sessions. The session focused on group work to achieve the following objectives to:
- identify opportunities for health sector representatives to collaborate with NMAs and other NGDI actors;
- articulate the most significant issues affecting mapping of health data; and
- determine resources available to help resolve issues and strengthen NGDIs.

Participants were divided into six groups with about 20 participants each. As their primary tool to achieve the group work objectives, facilitators relied on a worksheet containing a description of the work to be done, a short survey to identify the GIS capacity at disposal in each organization, and a matrix of the most important issues faced by these same organizations. The cumulative scores across all groups are as shown in figure 3. Each participant was asked to rank the top five issues. Figure 3 shows cumulative scores, in which the most import concern received five points, the second most important received four points, etc. For example, the issue of "spatial data" (lack of knowledge of what spatial data are available, knowing what spatial data organization might need, etc.) received the highest cumulative score of 18 points.
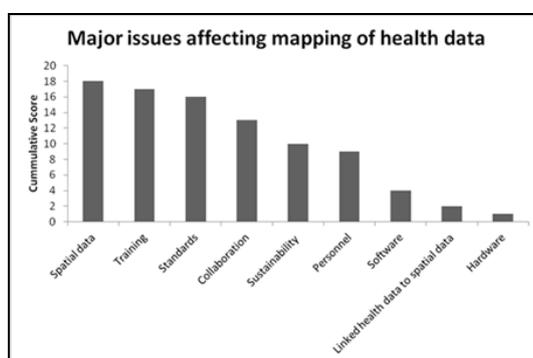

Figure 3. Cumulative scores across the work groups on top five major issues affecting mapping of health data in Nigeria.

The concern for training (second most significant priority) is that organizations require additional training to make effective use of GIS tools and methods. As the ranking and evaluation of these issues were group exercises involving participants from both the mapping and health sectors, the groups were able to facilitate a discussion to explore reasons behind these challenges and identify opportunities for overcoming them. The group work reinforced collaboration among summit participants; and served as major input into the summit communiqué.

5. Summit Communiqué

After two days of a highly enlightening summit, with over 120 participants in attendance, participants drafted a communiqué to capture their resolutions for advancing health and mapping sector collaboration in the development of NGDI and GIS capacity within Nigeria. The resolutions from the summit communiqué are captured below[6]:

- Develop a coordination mechanism for the linking of NGDI to the Nigeria health sector. The operation and secretariat of its implementation is proposed to be accommodated within the Department of Planning, and Research of the (FMoH) to serve as an NASRDA coordinated NGDI sectoral Node.
- Create an online resource centre on health geo-information.
- Facilitate the process of enacting a geo-information policy.
- Conduct an assessment for geo-spatial data needs for the health sector.
- Establish dedicated Web site for Nigeria Health and Mapping Summit of 2011 at the DHPR of the FMoH.
- Hold a Nigeria Health and Mapping Summit annually as a forum to showcase research/projects within the health sector.
- Involve and harmonize the efforts of relevant local training institutions in developing human capacity on geospatial studies in the health sector.
- Engage with other sectors such as water resources, agriculture, environment, etc. to start similar conferences.
- National Planning Commission to support Ministries, Departments and Agencies (MDAs) to develop effective funding mechanism through a budget line for the application of NGDI in their programs.
- Create an Internet forum for stakeholders to share technical discussions.

By adopting the Nigeria Health and Mapping Summit of 2011 communiqué, FGN and other stakeholders have recognized the value of linking health and mapping sector data and efforts. This is a first-of-its-kind formalization of the value of such linkages by a nation and the subsequent commitment to pursue such linkages. The communiqué can serve as a model for other countries in Africa. To view reports about the Nigeria Health and Mapping Summit of 2011 and its communiqué, please see the Federal Ministry of Health Web site www.fmh.gov.ng or MEASURE Evaluation Web site www.cpc.unc.edu/measure.

5.1 Maintaining Momentum from the Summit

The Nigeria Health and Mapping Summit of 2011 generated a high level of awareness among stakeholders concerning the need for and the benefits of collaborating for NGDI

development and GIS capacity building. As an example, following the summit the National AIDS and Sexually Transmitted Diseases Control Program requested GIS training support from MEASURE Evaluation. Also, based on the presentation of the summit communiqué to the executive and legislative branches of the government, some members of parliament have promoted the increased use of GIS within Nigeria.

To continue the momentum generated by the summit, the FGN, in collaboration with MEASURE Evaluation, committed to and achieved the following post-summit steps:

- A comprehensive report of the summit[6] was posted on the MEASURE Evaluation and Federal Ministry of Health Web pages in order to continue encouraging and fostering collaboration among summit participants.
- A final report to the Honourable Minister of Health, Honourable Minister of Science and Technology, Chairmen Senate Committees on Health and Science and Technology, House Committee Chairmen on Health and Science and Technology, and other relevant stakeholders was prepared.
- A 30-minute documentary about the Nigeria Health and Mapping Summit of 2011 aired on the Nigerian National Television Network, which has wide coverage in Africa.

In addition, the FGN and MEASURE Evaluation continue to assess the value of future conferences, especially extending beyond the health sector. This is in support of the summit resolutions calling for an annual meeting to continue health and mapping sector collaboration and to engage other sectors in the development of NGDI and the sharing of geospatial resources. Unfortunately, despite the positive resolutions generated by the summit, funding constraints have prevented such a summit from becoming an annual event.

The current lack of funding for an annual meeting underscores the fact that a two-day event such as the Nigeria Health and Mapping Summit of 2011 is limited in what it can accomplish, and should be seen as part of a longer and larger process. The key to successful realization of the Nigeria Health and Mapping Summit of 2011 was the involvement of all key stakeholders who formed part of the steering committee, but particularly the representatives from the NMAs and the health sector agencies. Ultimate success or failure rests on the will and desire within each organization or sector to continue collaboration. Encouragingly, based on responses to a post-conference evaluation survey, participants felt the event was a helpful first step in the long process of building linkages across the health and mapping sectors, and there was an expressed commitment among participants to build and strengthen those linkages.

In order to continue the collaboration begun at the Nigeria Health and Mapping Summit of 2011, the steering committee agreed to take positive steps to foster dialog between the health and mapping sectors. To that end, pending the establishment of a dedicated Web site at the DHPRS of the FMoH, the steering committee created the Nigeria Health and Mapping Network, which is a listserv based on the e-mail addresses provided by participants at the summit. The listserv is being used by summit participants to communicate with one another concerning important events.

6. Recommendations for a Successful Health and Mapping Summit

Apart from providing opportunities for Nigerian stakeholders in the health and mapping sectors to collaborate to improve health outcomes, the summit produced a number of recommendations that other countries should take into consideration if they are interested in holding a similar event. Below is a synopsis of the recommendations, which are organized as a sequence of steps.

6.1 Step 1: Obtain Buy-in from Stakeholders

Gaining the buy-in of key stakeholders is an essential element for success when organizing a collaborative summit within the context of social service and mapping organizations. The participation and involvement of stakeholders should be initiated by a local champion to spearhead the effort until a steering committee is formed. Once the steering committee is established, it can assume a greater leadership role in the buy-in process. This process needs to start early to identify stakeholder needs and requirements—and to communicate what will be required of stakeholders—while there is enough time to address issues or concerns. This will allow the development of an agenda that takes all stakeholder perspectives into consideration, which should provide a more accurate reflection of stakeholder interests in the country. Key stakeholders to include in the summit process are as follows:

- funding agency, such as USAID through the USAID mission
- ministry of health and related agencies to represent the health sector
- national mapping agency and related agencies to represent the mapping sector
- other key stakeholders such as donors that had previously supported or currently support mapping activities, including the World Health Organization and The World Bank; implementing partners working on health and HIV/AIDS projects that are currently conducting GIS/mapping activities in the country; national bureau of statistics and training institutions that have departments of geography and geo-informatics; the private sector, which can play a key role in maintaining geospatial information in a country; and news media

6.2 Step 2: Form Summit Steering Committee with Representation from Health and Mapping Sectors

The key role of the steering committee is to oversee the planning, organizing, and implementation of the summit activities as well as to ensure follow-through on summit resolutions and recommendations. The committee should consist of members drawn from government agencies that play lead roles in health and mapping activities within the country. The committee will need a chairman to coordinate and lead the business of the committee, such as presiding over meetings. Although the chairman can come from either the health or mapping sector within the government, the chairman should be selected based on NSDI development expertise, strong leadership skills, and the ability to obtain a high degree of cooperation with the mapping sector.

6.3 Step 3: Collaborate via Steering Committee to Reach Major Planning Decisions

Steering committee members will need to work together closely in order to reach the major planning decisions required to hold a successful summit. The major planning

decisions can be summarized as follows: agree on the structure and duration of the summit; draft an agenda for the event; identify key stakeholders to invite, especially leaders, speakers, and other distinguished guests who can contribute substantially to the summit's success; set a tentative date for the summit and schedule a pre-summit stakeholder meeting. The pre-summit meeting will enable the steering committee to agree on final summit details.

6.4 Step 4: Conduct a Pre-summit Meeting with Key Stakeholders to Make Final Decisions on Critical Details

The pre-summit meeting provides the opportunity for key stakeholders to address outstanding issues, including updates on venue selection, distribution of letters of invitation, and finalization of the agenda. After finalization of the agenda, the pre-summit meeting participants should agree on the list of speakers and the identification of leaders to facilitate group work and technical sessions. To address all outstanding issues, the steering committee should allow up to two days for the pre-summit meeting.

6.5 Step 5: Finalize Planning for the Summit

The month preceding the summit is the time to finalize preparations for the event. If not already done, the steering committee should ensure completion of the following: booking a location for the meeting; sending invitations to speakers, session facilitators, all other participants, and the media; making final revisions to the agenda depending on invitation responses; announcing the meeting to the general public, including creation of a print version for email distribution and posting of an announcement on select Web sites. For the Nigeria summit, for example, an announcement was made on the MEASURE Evaluation Web site. It is also recommended that event planners be hired to liaise with the steering committee and to manage the meeting's details.

6.6 Step 6: Hold the Summit

To bridge the divide between the health and mapping sectors in a country requires bringing relevant participants together into a conference. Hence, conference organizers should try to make this a two-way exchange between the health and mapping sectors. The summit should consist of opening ceremony to provide platform to the policy makers and legislature to set a tone for the summit. The second part should be technical sessions that focus on the identification of challenges to geospatial resource sharing, on the identification of challenges to geospatial resource sharing, and there should be a breakout session of group work to prioritize those challenges and to recommend solutions. The summit should develop a communique.

6.7 Step 7: Document and Communicate the Results of the Summit and Develop a Plan for Achieving Post-Summit Action Items

A key outcome of the summit should be an adoption of a communiqué that identify the resolutions adopted at the meeting for improving the NSDI with respect to the inclusion of health sector needs. The communiqué should be developed at an executive level to facilitate presentation of summit resolutions to both the executive and legislative

branches of the government, as well as to other key stakeholders, such as donors and ministerial agencies. Once written, the communiqué should be distributed as widely as possible, including to news media.

Finally, the post-summit should include the documentation and communication of the results of the summit and develop a plan for achieving post-summit action items. For instance, the Nigeria post-summit included a video documentary, presentation of summit report to the head of ministry of health and ministry of science and technology.

7.   Summary and Conclusions

Based on the experience of the Nigeria Health and Mapping Summit of 2011, it can be expected that a health and mapping summit will raise awareness among high-ranking government officials of the need to support multi-sector collaboration as a means to improve health outcomes in a country. In the short term, this greater awareness should facilitate progress in intervening to reduce HIV/AIDS and other high-priority health concerns, especially with respect to creating a higher receptivity to new initiatives. In the long term, if sustained, it should lead to more effective GIS resource sharing within the country and to more evidence-based decision making and better overall health for the general population.

A health and mapping summit can also be expected to stimulate dialog among stakeholders. In addition to the immediate benefits of increased communications for establishing working relationships and solving problems, an enhanced dialog between health and mapping sector representatives should help lay the groundwork for building long-term partnerships.

A health and mapping summit should produce an action plan for moving the country forward in terms of multi-sectoral collaboration to improve health outcomes. The action plan can be captured in a communiqué, such as the one developed by participants of the Nigeria Health and Mapping Summit of 2011[5].

The net short-term result of a health and mapping summit will be momentum. This momentum should not be squandered, but should be sustained by following through on action items and by producing tangible results. Momentum can also be sustained by making the health and mapping sector summit a regular event such as an annual meeting depending on the availability of funding. This would reinvigorate the process each year by stimulating fresh dialog, reinforcing working relationships, and facilitating creation of an updated action plan. Most importantly, however, stakeholders should act to establish health and mapping sector collaboration as an integral component of NSDI/NGDI development of a country.

Based on feedback from participants, the summit agenda was successful in achieving a balanced, two-way exchange between the health and mapping sectors. As a result, a similar approach to agenda development is advocated for other countries.

Acknowledgments

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