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Federal policy to local level decision-making: Data driven education planning in Nigeria

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This article discusses the implementation of local level education data-driven planning as implemented by the Office of the Senior Special Assistant to the President of Nigeria on the Millennium Development Goals (OSSAP-MDGs) in partnership with The Earth Institute, Columbia University. It focuses on the design and implementation of the Conditional Grants Scheme-Local Government Areas (CGS-LGA). CGS-LGA is an active federal policy programme in Nigeria aimed at transforming education policy into practice by providing technology and training to local, decision-makers to create local level plans based on data and then identifying the funding gaps for implementation of the plans. This article discusses the importance of the use of data in planning and in substantiating grant applications, as well as how CGS-LGA was introduced into Nigeria, and lessons learnt from the introduction of the program. A literature review provides information on the development of data-driven planning, and important components of such planning: development of data systems, importance of information to reform education practices, linking information through data to build accountability, and data-driven decision-making.

Keywords: Education policy; educational planning; data-driven decision-making; local government; millennium development goals; Nigeria

INTRODUCTION

Citizens have essential roles and responsibilities for ensuring the success of their local communities, their nation and, ultimately, the global world. Support and investment in the growth of human development can help sustain a nation's needs and aid further development. A primary demographic group that requires continual guidance and resources to thrive in life are school children. Many issues are important to ensure the welfare of this group, from school attendance, to learning outcomes, to access to education, teacher accountability, relevant curricula, and learning materials. The design

of data collection tools and education indicators, as well as the use of data, localised situation analysis, and organised planning can function as an effective strategy to identify gaps in the provision of resources, as well as help to define and link the most appropriate education interventions. This paper describes an active federal policy programme in Nigeria that, through local level plans, provides funds to help schools overcome gaps in essential inputs. These plans are created at the local level where needs can be quickly verified and data validated. The combination of education data collection, analysis, planning, and technology are of paramount importance in undertaking the program and producing interventions which can positively impact social, economic, and political layers of Nigerian society and beyond.

This paper underscores the importance of data in local education planning and funding requests. It begins by describing the Conditional Grants Scheme-Local Government Areas (CGS-LGA) federal policy program and then goes on to discuss the national data collection process. A literature review on types of data collected, use of education data in various contexts, and data-driven decision-making (DDDM) is presented, followed by a section on methods and discussion on use of data for the CGS-LGA grant application process. The paper concludes by highlighting some of the strengths and weaknesses of the process, and suggesting a more potent application of DDDM in varied settings.

CONDITIONAL GRANTS SCHEME TO LOCAL GOVERNMENT AREAS

In its Vision 20:2020 strategy to empower the state and local governments to deliver services to its population (OSSAP-MDGs, 2011), the Federal Government of Nigeria made a massive commitment to advance the education and health Millennium Development Goals (MDGs) in rural and urban LGAs across the country. The Office of the Senior Special Assistant to the President of Nigeria on the MDGs (OSSAP-MDGs) is responsible for transforming policy into practice, garnering support across the country, and combining human and financial resources through the use of dynamic localised strategies.

In 2007, Nigeria launched CGS, one of the largest poverty elimination programs in the world, towards achieving the MDGs by 2015. OSSAP-MDGs has been collaborating with Columbia University's Earth Institute since 2010 to develop and operationalize CGS-LGA. The collaboration constituted the use of a variety of tools, and the provision of technical assistance, technology, training, and knowledge sharing, including the development of the Nigeria MDG Information System (NMIS). This existing and expanding federal programme supports a number of primary and junior secondary education interventions in the LGAs and provides a good base from which Nigeria can progress towards its education goals, including improving the quality of education. As a robust process that invests in local ownership and data-driven planning, CGS-LGA provides a cost-sharing platform, requiring a combination of local and state monetary and personnel support.

CGS-LGA is, thus, a nationwide platform that provides selected LGAs with opportunities to obtain funding to support and increase educational quality in primary and junior-secondary schools in their areas. Though local needs form the basis of the funding, the policies and initiatives of national education agencies are foundational. CGS-LGA reaches millions of people and is a conduit for local level data-driven education planning. The CGS-LGA requires 200,000,000 Naira to each LGA for the purposes of increasing

the quality of education in the LGA. To obtain funding, LGA technical teams plan, write, and submit a proposal to OSSAP-MDGs bidding for an allocation of funds. In addition to information about how the funding would improve educational outcomes, the proposal must show how the state and LGA, and relevant national and international organisations, will contribute to the proposed CGS-LGA program. The LGA must contribute 20 percent, the state must contribute 30 percent, and the remaining 50 percent is contributed by OSSAP-MDGs.

Building a community of knowledgeable technical assistants who contribute to planning, implementation, and monitoring of their respective community development projects has been a large focus of The Earth Institute's work with OSSAP-MDGs. Technical assistants are the primary liaison between the LGA and OSSAP-MDGs. They also assemble and coordinate LGA technical and planning teams engaged in the development of a proposal. The funding proposal is expected to be professional, use relevant data, and provide localised situational analyses that explain the rationale for needed interventions. It should also incorporate all funding requests made to the LGA, the state, private partners, and OSSAP-MDGs.

OVERVIEW OF DATA SYSTEMS AND USES

This literature review is divided into four sub-sections. First, it outlines the development of data systems, entailing the creation of indicators and reporting. Second it discusses the importance of applying data and information to education reforms. Third, it discusses the importance of data for building accountability. Fourth it highlights key points on use of DDDM.

Development of data systems

Systematic data collection of relevant education indicators enables real-time analysis to inform policy, resource allocation, and programme design. DDDM is a method for analysing various types of data to develop and advance issues, institutions, and policy from micro to macro levels (Marsh, Pane, & Hamilton, 2006). It has been used for some time in the education sector. Marsh, Pane, and Hamilton (2006) explain that DDDM uses different types of data to inform decisions but note that DDDM is not a total remedy. Having data available and even transforming it into useable and useful knowledge is not an assurance that action will be taken; rather, action requires strategic support, buy-in, promotion, and a multitude of continual steps to be effective. Initial steps to ensure good decision-making include: goal-setting, ease in using data, linkage to continuous improvement, and creation of a data information system (Datnow, Park, & Wohlsetter, 2007). These steps should then be followed by collection of appropriate data then transformation of the data into appropriate indicators, use of a data management system, and capacity development for users of data (Datnow et al., 2007). These are the steps The Earth Institute and OSSAP-MDGs took to develop the Nigeria MDG Information System (NMIS) and training of technical assistants on NMIS, indicators, data analysis, and relevant tools.

Blank (1993, p. 67) recommends four steps for developing data systems. First, develop a conceptual framework based on the research question in mind then secure commitment from stakeholders (policymakers, educators, researchers, data managers). Stakeholders could use these criteria to decide on the final set of indicators, the importance and usefulness of indicators, technical quality of data, and feasibility of obtaining data.

Second, select a limited number of indicators to minimise complexity in reporting. These indicators then form the "cooperative data system" (p. 71) needing to be developed and linked to data collection processes. Blank recommends working with the ultimate users and providers of this data system to establish standards for producing comparable data. The third step is to match comparative data with reported indicators. The final step is to collect data and report on indicators. Blank points out that the most critical point is to ensure common agreed standards are set for aggregating and reporting data collected by multiple stakeholders.

An example of a large electronic data set is India's flagship programme, District Information System for Education (DISE),[1] SSA (Sarva Shiksha Abhiyan), which computerizes school facility data. DISE is jointly managed by National University of Educational Planning and Administration (NUEPA), Department of School Education and Literacy, Ministry of Human Resource Development (HRD), Government of India, and UNICEF. Data from the annual census of more than 1.4 million primary schools and 205,000 secondary and higher secondary schools is recorded, processed and displayed each year in the form of publically available school report cards. With this data, an updated school directory is maintained and multiple reports are generated on the status of key indicators. Individual data, including: school-going population, number and type of schools; school infrastructure; medium of instruction; grants received and utilisation status; and training of teachers, is compiled at district, state, and national levels.[2] This forms the bulk of data collected at the school level. However, the use of this data at district or state level for planning purposes is not systematically documented. There seems to be lack of coordination between different government agencies, hampering use of this data in a holistic way.

Importance of information in education reform

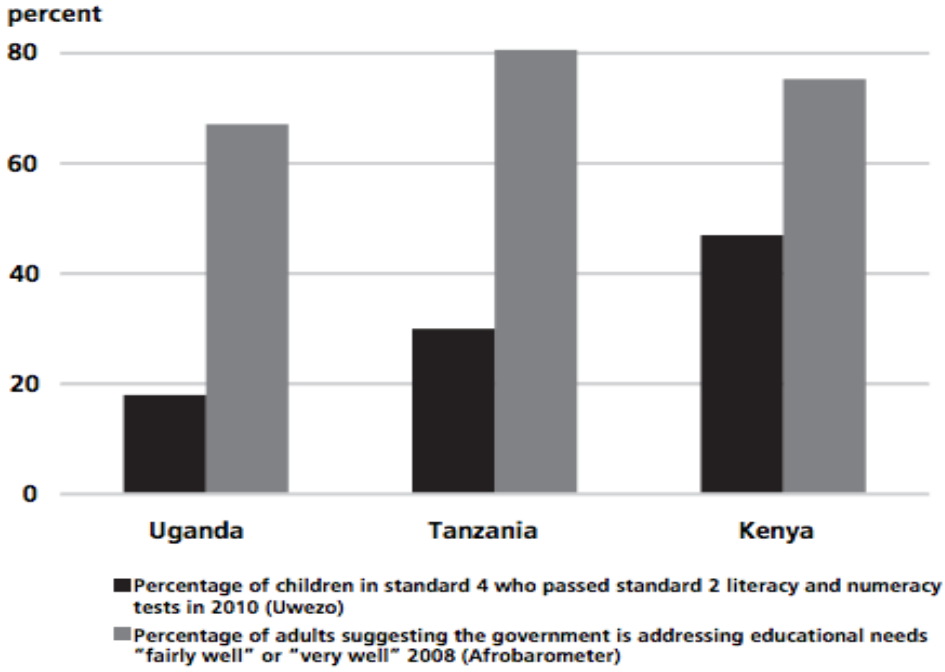
The provision of information or data availability at all levels of the education system (schools, districts, regional, and national) is critical to cultivating policy and implementation-related changes. Lehtomäki, Janhonen-Abruquah, Tuomi, Ikkolin, Posti-Ahokas, and Paojoki (2013) note that a qualitative approach embracing local participation for gathering data and information when conducting international education research is fundamental, because voices from the field are essential sources. Willms (2004) states that many school boards, teachers, and administrators rely on working knowledge to make decisions. This includes some facts, principles, and perceptions guided by personal attitudes and beliefs. However, these decision-makers are aware that this working knowledge has limitations and Willms (2004) suggests that monitoring data can be used by such decision-makers in multiple ways. For instance, data can be used to identify specific problems, providing a basis for discussions towards a solution. An example of this is that data can suggest weaknesses in a pupil's mastery over specific curricular topics and, therefore, guide instructional practices in the school. Monitoring data can be used to assess effectiveness of interventions implemented at various levels—state, district, and school—while also giving rise to new ideas for influencing policy and practice. Willms (2004) also suggests that monitoring data can help administrators and teachers to reduce inequities. For example, teachers could collect frequent test data to inform and improve teaching practices.

[1] For more details on DISE, visit: http://www.dise.in/

[2] For more details on report cards, visit http://schoolreportcards.in/SRC-New/Default.aspx

The Study Group on Measuring Learning Outcomes (2013) suggest that, since there is no universal understanding of "learning", people interpret its meaning in different ways. Figure 1 shows that, in the absence of knowing what "learning" should mean, parents have a skewed perception of how well the government is addressing educational needs; parents' perceptions show little alignment with the reality of poor performance of students in grade 4 who passed grade 2 literacy and numeracy tests. The Group make the point that assessment information should target perceptions of parents and politicians in order to develop improvements in learning outcomes.

It is often the case that parents show an interest in their children's education but lack the knowledge of how to participate in schools. Schneider, Teske, and Marschall (2000) point out that there is often inequitable distribution of information about the local school that varies by socio-economic status of the parents, with low-income families having very little information. In addition, even if parents want to help the school by using their collective power through Parent Teacher Associations, there are usually no clear guidelines as to how parents should proceed. Schneider et al. (2000) term such parents as "marginal consumer" (p. 52).



Source: Uwezo, "Are Our Children Learning? Numeracy and Literacy Across East Africa," mimeograph, Dar Es Salaam (Uwezo, 2011) and Afrobarometer surveys available at www.afrobarometer.org.

Figure 1. Satisfaction Results in Education (In East Africa)
Source: Pritchett and Banerji (2013, p. 13).

An Indian based non-governmental organisation (NGO) conducted a field experiment to test the hypothesis that more publicly available information about schooling for parents leads to improved educational outcomes. Pratham supported different types of advocacy campaigns in 190 of 280 villages in 2005 (Banerjee, Banerji, Duflo, Glennerster, & Khemani, 2007). The main objective was to communicate to village citizens the status of learning among their children and the potential roles that Village Education Committees and local governments could play to improve learning. The NGO held meetings in the villages with multiple stakeholders to report and discuss the literacy rates of 6 to 14 year olds in the community, and to urge stakeholders to ask questions about the invariably low

literacy rates. The question was: if you provide people with information that children in the community are not learning in school, does that information trigger the community to find local solutions to the learning problem. The study showed that sharing information about low learning levels by itself showed no effect on improving these learning levels. However, when the same information was combined with an education intervention where community volunteers were organized to run literacy classes with the Pratham methodology, there was an increase in the learning levels of the 6-14 year olds in the communities. This package (information and community based classes) showed improvement in the literacy among 6 to 14 year olds in the community as compared to only information provision (Banerjee et al., 2007).

In a similar vein, Panday, Goyal, & Sundaraman, (2011) test the premise that information campaigns targeted towards school committees will lead to improved awareness and participation in the school committee's oversight function and, consequently, improve teacher efforts and student outcomes. The campaign was conducted in three Indian states: Karnataka, Madhya Pradesh (MP), and Uttar Pradesh (UP). Communities were randomly assigned to receive information on their oversight roles in local public schools. Baseline and follow-up surveys were administered to communities to measure outcomes. Focus group discussions were held with community members in UP and MP.[3] State specific information was disseminated in 11 to 14 public meetings in each treatment village over two-and-a-half years. Results from UP and MP showed that improved information to community members led to improved learning outcomes along with reduced teacher absenteeism and improved teacher efforts. School communities in the two states also became more active as shown by increases in the membership of the committees, number of committee meetings and school visits. Findings from Karnataka showed a more indirect effect of the intervention. Teachers with reduced efforts at baseline were more likely to be transferred out of schools in treatment villages. There was no impact on committee member participation in spite of an increase in knowledge. The authors stated that school committees in the state do not have any direct control over teacher efforts, unlike in the other two states. In terms of the learning outcomes, mathematics scores, however, tended to improve in all three states. The authors note that classroom-teaching practices that were not measured in the survey were likely to have been influenced by the survey. Focus group discussions in UP and MP illustrated that information campaigns led to significant improvements in the functioning of school committees and in teacher effort. More members reported awareness about school accounts and became aware of the roles and responsibilities of the committees.

Information to boost financial accountability in the education system

Has information provision improved school financing? One key study conducted by Reinikka and Svensson (2002), using Public Expenditure Tracking Survey (PETS) in Uganda, found that, on average, only 13 percent of the annual per-student (non-wage) grant from the central government reached the school between 1991 and 1995. Eighty-seven percent either disappeared for private gain or was used by district officials for purposes unrelated to education. The authors further contend that, in 1995, for every dollar spent by central government to support primary schools non-wage expenditures,

[3] The study cited that the focus group was not conducted in Karnataka due to reasons of limited resources.

the schools, on average, only received 22 cents. Four years later, in 1999, the Ugandan Ministry of Education and Sports review found that the median school now received 90 percent of the capitation entitlement (Hubbard, 2007). Reinikka (2001) explained that in 1996 the Ugandan government actively implemented changes to increase public awareness and accountability by obliging all district headquarters and primary schools to post notices on public boards noting their monthly funds transfers. This was implemented since the information campaign and newspaper media coverage were a big part of the school grant (Hubbard, 2007). The 2002 PETS confirmed that more (80%) schools received the capitation grant. The survey also revealed that schools with access to newspapers now received an 8.68 percent greater share of their entitlement than schools that did not have access to newspapers (Hubbard, 2007). This case indicates that more public data and information about the grants schools received increased public awareness of "leakages" in the system and also significantly reduced "leakage".

India has legislated the public's right to knowledge about how funds are acquitted in the *Right to Information Act*. The *Act* empowers any Indian citizen to file an application with authorities to know where and how public funds are spent. Following the successful rollout of PETS in Uganda, the Tanzanian government adopted the PETS model and undertook two surveys in 1999, 2001, and a school pilot study in 2003 (Sundet, 2004). In Tanzania, PETS had a measure of success resulting in important data and key findings such as the need to advertise monetary transfers to the public, as financial accountability did not trickle down to district levels (Sundet, 2004). However, the robust discussion that materialised in Uganda with PETS was rather subdued in Tanzania; the anticipated large-scale public discussion and action on data, financial allocations, accountability, and transparency did not materialise (Sundet, 2004). Sundet (2004) emphasises that "information, education, and communication" (p. 4) must all work together for a successful PETS. Beyond PETS, Sundet (2004) notes the importance of civil society studies, training, monitoring, and initiatives that occurred in Tanzania. He emphasises that links between civil society organisations and government is the best approach. Organisations such as Twaweza[4] in Tanzania are actively advocating for open data systems.

Linking education outcomes to school financing represents a recent paradigm shift in education. The argument is that student outcomes should be closely associated with school finance. An important point to note, however, is that funding alone cannot make a difference; efficient allocation of funding matters (Pritchett & Filmer, 1999). It has taken many years to realise that school input-driven solutions do not, alone, improve student learning (Aiyar, 2013). Looking at outcomes and backtracking to see if school funding was a problem is a process adopted by multiple NGOs. For instance, Janaagraha, an NGO based in Bangalore, initiated the Public Record of Operations and Finance (PROOF) in July 2002 in partnership with three other[5] citizen-based organisations. This coalition of NGOs conducts site visits to the city schools and collects school performance indicators through questionnaires. Coordinators from the NGOs Janaagraha and Akshara compile this information into school report cards and share results with senior Education Department officials and school administrators. Programme coordinators then perform follow-up visits to schools to help them understand the scorecard, followed by additional

[4] For more information on Twaweza, visit http://twaweza.org/

[5] The other three organisations are 1. Public Affairs Centre (http://www.pacindia.org). 2. Voices (http://www.voicesofindia.org) 3. Centre for Budget, and Policy Studies (http://cbps.in).

school visits by senior Education Department officials. School visits sometimes result in immediate approval of school water facility and repair-work orders, depending on scorecard details. The programme coordinators help the schools update their budgets, then review budgets for the next financial year.

The idea underscoring this activity is matching the quality of education and teaching/learning materials supplied to the school with respective budgeted amounts. Thus, performance measurement is linked to the budget cycle, which demands more accountability. The process aims to understand the school system and its weaknesses, while using the idea of community ownership of the school to undertake reforms. This example highlights processes that help build community-based accountability measures around school functions. Through such efforts, municipal bodies (like schools) are asked to share details of their funding and are thus held accountable to ensure that they function in accordance with the funding received. Therefore, if children are not learning in school, it is not attributable to schools not receiving the funds on time, but because of other factors.

Data-driven decision-making

Picciano (2009) emphasizes "hardware, software, and people" (p. 123) as the essential base of DDDM and the development of information systems. Accessible information shared amongst stakeholders and their networks, combined with curated professional development can lead to, what Picciano (2009) terms, "collective behavior" (p. 127) yielding more productivity in analyzing data and making decisions. Use of software, integrated within a user-friendly platform for data presentation, analysis, and reporting, provides a combined relevant and holistic information system for DDDM when coupled with strong leadership. Although Picciano (2009) focuses on DDDM based on a school district information system, the DDDM is similar to Nigeria's CGS-LGA. The accessible integrated NMIS platform, continual training, emphasis on data analysis, importance of technical assistant leadership, and community input of CGS-LGA align with Picciano's (2009, p. 123) "hardware, software, and people".

Bettesworth, Alonzo, & Duesbery (2009) highlight the absolute need for educators to receive professional development on data analysis and use of data to improve DDDM. Professional development workshops should be collaborative and structured and combined with continual support beyond initial workshops (Bettesworth et al., 2009).

Data is abundantly available but the ability to undertake quality data analysis yielding reliable results and informed decision-making needs to be nurtured (Castellani & Carran, 2009). An accessible and integrated technological data platform is essential to DDDM. When combined with group teams, trainings, and leadership, it creates a climate of accountability and change (Castellani & Carran, 2009). An essential element to DDDM is knowledge management, which should entail "people, processes, and technology" (Castellani & Carran, 2009, p. 313). Sharing of information, teamwork, developing learning groups, and developing processes for data access, use, and analysis, as well as determining the array of technological components are steps both within the knowledge management cycle and CGS-LGA. Technology can vastly improve the DDDM process but not alone. Rather, it needs to be accompanied by leadership, professional development, accountability, and processes (Castellani & Carran, 2009).

Dunlap & Weber (2009) also emphasize that, in order to make better decisions, there is a need for leadership, training, monitoring, and the ability to reliably analyze and apply

data. Dunlap & Weber (2009, p. 452) find that to improve data use, it was necessary to ensure information on data definitions, have reliable data sources, and enable direct individual access to information. These three components were embedded into the NMIS platform accompanied by the provision of information during training sessions. Supovitz and Klein (2003) highlight the need for school commitments of "time, training, technology, and discipline" (p. 37) for informed data use. These four components are core elements of CGS-LGA.

The culture of use of data had to be developed amongst technical assistants, because it was a new endeavour. Recognition of the need and ability to navigate NMIS and analyze data responsibly using provided tools was a "cultural shift". Dunlap & Weber (2009, p. 452) highlight that such a "shift" is essential to enable commitment to DDDM. "Data literacy" (Hubbard, Datnow, & Pruyn, 2013, p. 54) is not a skill amongst all education professionals involved in using data, but developing it through teamwork and the sharing of information can lead to an improved skill set accompanied by leadership for an essential "shift" (p. 60) to occur.

Findings from Levin and Datnow's (2012, p. 185-86) study at a school in the United States point to four actions that guided DDDM: "curated goals according to needs, structures to guide DDDM, development of human and social capital, and a culture of data use and teamwork". These four points align with CGS-LGA's local level focus on data and technological tools, professional development, leadership, and building a culture of data use and teamwork amongst technical assistants. Additionally, Levin & Datnow (2012) found it was necessary to complement data with a comprehensive view of the situation. Coupling data and data analysis with local needs assessments is required for CGS-LGA proposal development in order to ensure a fuller perspective and presentation of local needs and gaps.

The use of data dashboards was found to be appealing and helpful for school staff to access data, making DDDM more user-friendly (US Department of Education, 2010). NMIS was designed to be user-friendly and features various visual displays, including maps and photographs, all accompanied by various planning tools. In Nigeria, use of a single technological platform (NMIS), professional development, tools, collective teamwork, building a culture of use of data, and combined leadership, led to a shift towards advanced skill sets in data analysis, improved DDDM, and continuous improvement of processes for determining appropriate local education interventions for education stakeholders and local governments. Linking data to points of improvement was obligatory because a premise of CGS-LGA was data-driven planning and decision-making.

However, simply developing a data system does not guarantee its use. Extra steps are required to digest data and apply it to make a difference in education practices and reforms. Studies show that information tends to lead to increased accountability, but more research is required on type of information, format and audience involved to make this happen. Development of a data system needs to be accompanied by trainings, which helps to ensure the education indicators and technological interface are understood. Data buy-in on the part of the OSSAP-MDGs staff plays a large part in the use of data for grant applications, providing a concrete platform and facilitating the process of data vetting and validation at the local level. Since applications are written at the local level, at the source of the data, the validation of the data is easier. Also, since the stakeholders (government agencies) at the local level are the ones that know what the sector needs, they can identify

funding gaps and use the data to validate grant requests. Therefore, creating platforms where the impact of the information is visible is central to ensuring that stakeholders use the data collected. The following sections provide background to the CGS-LGA project and present some weaknesses in the program that need further improvement.

METHODS

Tools, data collection, and indicators

As part of the process for developing CGS-LGA, it was determined an essential component would be to have a set of local-level data available to assess issues critical to primary and junior secondary education in LGAs. Initial steps included collaborative meetings between OSSAP-MDGs, sector specialists, and Earth Institute teams who, in concert, developed a baseline facility inventory. The inventory was also influenced by suggestions from local level education agencies. The baseline was formatted in a spreadsheet with syntax language compatible with two open-source tools used in the process, Formhub[6] and Open Data Kit Collect.[7] Through these tools, the baseline was uploaded to Android phones. Trained enumerators used the Androids to conduct both a pilot and the full baseline in the LGAs.

This mobile-based data collection method allowed for efficiency and development of technological skills amongst the technical assistants and enumerators. After collected data was uploaded to Formhub, data was cleaned then transformed for display onto NMIS. Additionally, data from two Nigerian institutions, the National Population Commission and the National Bureau of Statistics, was integrated into NMIS. In the version of NMIS at that time, there were ten education categories, including access, infrastructure, and participation, which had corresponding indicators. Complementing the data were various visual displays including maps and photographs. Materials to analyse data and support programme planning were developed by the education and health sector teams at The Earth Institute as tools to be applied in real-time by technical assistants. The data and tools are a complementary group of materials delineating relevant indicators and strategies and, when combined with a local assessment, guided selection of the most appropriate local education interventions.

Proposal development

An indicator definition list was created to support technical assistants in their understanding and application of the indicators. All indicators were grouped under the following categories: school enrolment; school continuation and completion; gender parity and equality; and literacy. Alongside, to aid planning and budgeting for tangible gaps, the following categories were included: infrastructure, furniture, teachers, and teaching materials and textbooks. A list of applicable indicators, ranges and targets coupled with Nigerian policy recommendations and strategies to improve the respective indicators were presented as education policy packages to serve as technical guidance.

The development of practical tools and trainings were key priorities set forth by The Earth Institute. Several training sessions were held in Abuja, Nigeria from 2011 through 2013, to present and transfer information to respective audiences, which, over the course of

[6] http://formhub.org/
[7] https://opendatakit.org/

training sessions included OSSAP-MDGs staff, zonal technical officers, technical assistants, field enumerators, sector experts, and LGA chairmen. With emphasis on data-driven methods informing primary and junior secondary education needs of the LGAs, the technical assistants became well positioned to continue building their skills in using mobile data devices, assessing needs, surveying, and identifying gaps. LGA proposal teams conducted needs assessments through community surveys, convened community stakeholder meetings, collected data from NMIS, and assembled data from their education sector gap worksheets, which highlighted service delivery gaps. With the resulting information and data from these sources, exercises, tools, and analysis, the LGA proposal team had a strong foundation to make informed decisions and begin development of their proposal.

Proposal review

From March to April 2013, representatives from OSSAP-MDGs and The Earth Institute comprised a committee who worked collaboratively through an organised, extended, and multifaceted process to technically vet 148 proposals for potential funding. Through well-supported information management systems, an online database was created by OSSAP-MDGs to retain and track all LGA requests via sector, intervention, location, quantity, and total amount requested. Scoring sheets were used by committee review members to score each intervention based on criteria. For instance, the education score was based on data, justification of prioritised interventions, and consistency with sector packages. The education technical review of the proposals was linked concurrently with review of LGA education gap sheets and indicators in NMIS, which functioned as references to contextualise the rationality of requested interventions.

Assessment of proposals was not only based on numerical scoring because comments and recommendations were also included. Each proposal received overall comments, implementation suggestions, intervention-specific comments, and a recommendation ranking for each requested intervention. After the proposal review was completed, a LGA summary report highlighting interventions, approval status, final comments, summary of the iterative review, strong and weak sections, and implementation recommendations were presented for final approval to senior team leaders from OSSAP-MDGs and The Earth Institute, who then made final determination on awarding CGS funding. The CGS-LGA proposal is a significant part of the robust CGS platform as it forms the pathway from contextualised needs to planning and implementation with simultaneous monitoring.

FINDINGS AND DISCUSSION

Use of data in proposals for 148 LGAs, March 2013

In the proposals for 148 LGAs reviewed in March 2013, many included data from NMIS and community needs assessments. Gaps were highlighted in tables and narrative, with some proposals providing description on how gaps could be addressed and be improved, and which partners could potentially provide funding support, such as Universal Basic Education Commission, State Universal Basic Education Board (SUBEB),[8] and the Federal Teachers Scheme. Visuals, such as pie charts, photographs, and bar charts, were often added to the situation analysis section. Linking indicators together, such as net

[8] SUBEB is the state government agency responsible for all government primary schools in the state.

enrolment rates and gross enrolment rate with schools located 1km or 3km farther from catchment area, was presented in proposals. The LGA teams analyzed the available data in NMIS and the collected data from community assessments vis-à-vis the situation analysis and determined interventions for CGS-LGA funding. If proposals requested classroom repairs, included would be the indicator on repairs to verify the need and often pictures of classrooms in need of repairs in the schools in question. Each need had to be verified using indicators or external data sources. The identified needs and interventions were linked to school enrolment, completion, and continuation issues. Aside from the infrastructure, furniture, teaching staff and teaching material indicators, the ten most prevalent indicators used were: 1) net enrolment rate, 2) gender parity index, 3) farther than 1 km from the catchment area, 4) transition rate, 5) literacy rate, 6) students' living farther than 3 km, 7) functional library, 8) gross enrolment rate, 9) first aid kit, and 10) multi-grade classrooms. In the 148 LGA group of proposals, education interventions were requested and approved for implementation in the LGAs, with a portion as presented in Table 1 (below).

Table 1: Sample requested and approved interventions, 148 LGAs proposal group, March 2013[a]

Infrastructure	School furniture	Teaching materials	Textbooks	Other
Construction of classroom blocks	Bench for pupils	School stationery	School textbooks	Campaigns
Renovation of classroom blocks	Dual desks for pupils	School exercise books	Training	Training/capacity building
Hand pump boreholes	Desk/chairs for teachers		School instructional materials	Motorbikes for school inspectors
Rainwater storage at schools	School chalkboard			First aid kits
VIP toilets in schools				

[a] Source: The Office of the Senior Special Assistant to the President of Nigeria on MDGs. (2013) CGS LGA Programme Proposals, March 2013

CGS-LGA grant proposals were meant to present a complete funding plan at the LGA level. The proposals identified funding gaps and requests for funds that did not overlap with other existing funding sources. Essentially, CGS-LGA grant proposals became a useful tool for local-level planning operationalized by multiple stakeholder groups led by local technical assistants.

Gaps in data usage

Trainings on data use and proposal development were conducted with technical assistants in preparation for creating a strong proposal. While there were presentations on data use and opportunities for practical experience in small groups at trainings, the culture of use of data was new. Therefore, extra effort was taken to introduce multiple exercises in training to provide examples of data integration into proposals. Multiple case studies were used to highlight the importance of data. The writing of proposals was also new for some technical assistants who required additional guidance. Technical assistants could send

their proposals for quick feedback to the education sector team at The Earth Institute before commencement of the actual proposal review round.

In earlier rounds of proposal review for the 113 group in 2011, the indicators and the situational analysis did not seem to be connected or to narrate the same story. In most cases, indicators were included in the proposals; however, they were not linked to what was being asked or explained for the needs of LGAs. For the 148 group in 2013, there was tremendous progress, though linkage of data to contextual situations in the proposal could have been strengthened by describing, in-depth, why, for instance, a transition rate is low by linking it to the reasons why students drop-out or repeat.

NMIS did not include outcome-based indicators such as student learning, due to non-availability of such data on a country-wide scale. Therefore, most funds were delineated towards the purchase of tangible materials. However, proposals were reviewed based on their holistic approach to education involving tangible (materials focused) and intangible (quality education focused) investments. In most cases, the intangible investments were catered to by other funding sources. OSSAP-MDGs funds were top-ups to existing needs, rather than creating the needs. This approach had its downside where needs such as community campaigns for education were not among the majority of interventions requested for OSSAP-MDGs funding. Though the proposals mentioned the campaigns or community mobilisations as a part of education interventions funded by other sources (from LGA and the state), there could have been more emphasis. Continuous improvement to the culture of use of data by the technical assistants shifts to OSSAP-MDGs as they have taken full responsibility for the CGS-LGA proposal development and review process.

CONCLUSION

The use of a data-driven approach to education planning at the local level is a process that requires commitment from stakeholders. OSSAP-MDG's efforts are unique as they highlighted the dearth of data on schools at the national level and invested in creating a baseline facility inventory. They also conducted multiple training sessions with The Earth Institute to underscore the importance of using data in proposal and for local planning, and to encourage a move away from requests for funding based on anecdotal evidence. The training conducted to make NMIS easy to understand along with its user-friendly manuals were steps in the right direction. The use of Android phones drastically cut down data processing time. Maintaining an online repository of data that could be shared with all technical assistants and project staff facilitated the use of data in proposals. There were clear guidelines that proposals had to include the indicators needed to justify grant requests. Detailed planning at the LGA level was only possible if there was a common database with current indicators that all government levels were able to access at the same time. NMIS provided a platform to start discussion on education indicators. In cases where technical assistants had more updated data, these were used in the proposal and the source cited. With every round of proposals, quality improved. Use of indicators in combination with a situation analysis became well integrated to justify needs.

For The Earth Institute and OSSAP-MDGs, this data-driven planning has been a long process. It took many iterations and learning with each step. Tailoring training materials to needs of technical assistants and training on proposal writing improved over the course of three years. Technical assistants are now a cadre of professionals who can liaise with

multiple stakeholders at the local level to identify existing needs, gaps not funded by other agencies, and work together on a proposal validated by existing data at the local level. Multiple training sessions and customised exercises were used to conduct professional development sessions with technical assistants. Working with multiple stakeholders at the local level to identify funding gaps along with prioritising sector needs also required constant support from OSSAP-MDGs.

There are many processes that need improvement. For instance, the tendency to apply for material inputs for education that leave out interventions that improve quality education (e.g. teacher training) still needs to be addressed. Material procurement was more popular than recruiting teachers or conducting teacher training (also funded by the State and LGA). In a similar vein, community mobilisation was a recommended strategy; however, with no indicator to support, concomitant with difficulties in budgeting for such a campaign, it became difficult to request. Other data-related issues included coverage of the schools; that is, NMIS did not exhaustively cover all government-funded schools in the LGAs due to a number of logistical reasons. Therefore, technical assistants conducted their own community assessments or had to review each school on NMIS to use the data in the proposals. On the technology side, maintaining the data website and updating it has associated costs. Cleaning and data processing also took time and expertise. Debate can continue on the best operational indicators for NMIS to include. A set of indicators that will satisfy users at the local, state and federal levels for different needs will be difficult. NMIS currently is designed to best suit the needs of technical assistants for the CGS-LGA grant application. Though more fine-tuning of indicators and their definitions could help improve the version of NMIS used, it was a positive start to assess the status of basic school-related indicators on a national scale. Regardless of these challenges, NMIS holds a unique role providing the most updated nationwide data that different stakeholders can use to conduct local planning. Additionally, NMIS was updated in 2014 through a "data mop-up" process, a feedback mechanism was integrated into NMIS for user feedback, and updates are forecasted.

In August 2014, OSSAP-MDGs publically released NMIS, http://nmis.mdgs.gov.ng/. Different stakeholders, such as government agencies, community-based organisations, researchers, journalists, civil society members, and universities, can use the data for planning. This open source data has enhanced the potential to make more of an impact on education planning in Nigeria. With sparse and intermittent availability of basic multi-sectoral data in Nigeria, NMIS was able to fill the data gap. Design of policy approaches and programmes coupled with their implementation, such as OSSAP-MDGs' CGS-LGA are practical vehicles towards improvement of physical and quality components of schools. It serves as an interesting case study of a data-driven planning process that invites different stakeholders to create a common financing platform at the local level.

This Nigerian experience has been showcased as "best practice" in multiple Post-2015 discussion forums. Recently, the United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development showcased the Nigerian facility inventory in reports and events. This mapping of Nigeria's social infrastructure was also showcased by UNESCO's Broadband Commission for Digital Development[9]. The Sustainable Development Solutions Network also cited NMIS as one

[9] Full report available at http://www.broadbandcommission.org/Documents/reports/TF-Post2015-advocacy-2014.pdf

of their priority areas in terms of promoting geo-referenced data and integrating complementary facility based metrics into the Sustainable Development Goals (SDGS) framework.[10] As a complement to the more traditional household survey based indicators, there is discussion on collecting regular facility (schools, health clinics, water points) based inventories as a part of the Post-2015 data priorities. Therefore many of the elements of this "real-time" data collection with the purpose of local level planning has potential of being scaled-up to other countries in the Post-2015 SDGs era.

The CGS-LGA policy focus on education planning at the local level via use of data, technology, professional development, tools, analysis, localized assessments, and technical expertise represents components that could be beneficial for DDDM efforts in varied settings. These include: 1) data collection using an Android phone for more efficient and seamless processing; 2) programmatic design focused on localized context and planning attuned to meeting particular needs; 3) imparting a culture of use of data amongst technical professionals through multiple workshops, tools, and supplementary material; 4) applicable supply-side education categories and indicators for comparative use; 5) technological platforms such as NMIS for spatial planning and Education Management Information System features; 6) local planning program design informative for philanthropic investments and international community projects; 7) partnership as fundamental and key aspect of realizing a program; 8) case study on local level data-driven education planning and decision-making; 9) professional development inclusive of presentations, practical exercises, group work, preliminary drafts, new skill sets; and 10) open-source data for varied purposes including access to information and accountability. Therefore, in the Post-2015 phase of the SDGs, NMIS provides a solid platform to measure, track and use indicators to meet social goals through an integrated multi-sectoral approach in order to facilitate reaching multiple targets of the SDGs.

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