Evidence-based Infrastructure Planning in Ghana

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District Assemblies (DA) are the local governance structures in Ghana responsible for planning and implementing development projects. Decisions regarding infrastructure project selection (type and location) and prioritization at the district level are often based on political influence, group consensus, or individual knowledge. These decision-making processes are limited in transparency as they are typically not repeatable. The lack of transparency fuels mistrust of the DAs with development partners and communities, and can limit the progress of the districts on measured indicators (e.g., water coverage, immunization rates, etc.). Improving the decision-making process by including district community data has many benefits for DAs and Development Partners.
The challenge of aggregating and analyzing data to inform repeatable and transparent infrastructure decision-making processes is one that is also faced by Canadian municipalities as they work to implement strategies for proactive management of large asset bases. This article will summarize the current status of data based decision-making by local governments in Northern Ghana, and will attempt to draw parallels between evidence based infrastructure planning in Ghana and Canada.

I. GOVERNANCE AND SYSTEMS OF INFLUENCE IN GHANA

Ghana is governed at three levels; Central, Regional, and District. These levels parallel Canada’s Federal, Provincial, and Municipal/County government levels respectively. It is argued that decentralization of government is vital for efficient and effective service delivery. Ghana’s decentralized governance legislation, enacted in 1988, outlines the structures and processes for how the District Governments should be functioning and managing infrastructure. Unfortunately, due to a number of factors (not directly addressed in this article) these processes fall apart at the stage of implementation, and the District Governments are not functioning as intended.

Governance systems in Ghana are further complicated by the influence of other international and local institutions working with the goal of poverty reduction. There has been a shift in the international development community for non-governmental organizations (NGOs) and other development agencies (herein collectively referred to as Development Partners) to deliver their projects through government structures. This is a well intentioned shift as, in theory, it allows the government to prioritize projects for communities in need and coordinate the efforts of many disconnected agencies. Unfortunately, if the government structure is not functioning, a bottleneck develops and services are not delivered efficiently or in the manner intended.

II. USING DATA TO INFORM INFRASTRUCTURE INVESTMENT IN NORTHERN GHANA

Despite the best intentions, government infrastructure decision-making processes are not always rooted in solid data and information. The use of data to inform decisions is conceptually simple, but the implementation of the process can be difficult and complex. In Canada, there is an increasing focus by municipalities to implement systems of holistic asset management. Part of a holistic asset management system is the use of quality data and evidence for informing infrastructure decision-making. The direct consequence of not using data to inform decision-making is that public money is not always spent efficiently and effectively to improve service delivery. In Canada, this results in a disgruntled public that is unhappy with public service delivery. In Ghana, the results can be potentially more severe as it can mean that conditions for people living in extreme poverty are not improved and their vulnerability is not reduced.

Engineers Without Borders (EWB) Canada is working with local district governments in the Northern Region of Ghana to improve infrastructure delivery to communities. One focus area of this work is to improve the use of data in infrastructure planning and asset management.

III. IMPORTANCE OF DATA BASED DECISION-MAKING

Quality data and information on current community assets and living conditions are required to ensure infrastructure investments meet the criteria set out above. Examples of quality of life indicators that can be used to inform infrastructure spending are: Number of incidents of water borne illnesses; immunization rates; number of schools within an area compared to number of school aged children. For infrastructure investments to improve the quality of lives of people living in extreme poverty, infrastructure investments must be:

1. **NEEDED**
   When there is a limited pool of resources (as is the case for all government bodies), money must be spent on projects with the highest return on investment. In northern Ghana, this means the improvement in quality of life for the largest number of people. It also means investing money in solving the root cause of a problem, and not only addressing symptomatic issues. For example, a community that does not have potable water is unlikely to attract a teacher. Therefore, building a school in this community before the water issue is resolved provides little value.

2. **APPROPRIATE**
   Infrastructure is appropriate if it is suitable to local environmental conditions, and can be managed and maintained using local resources.

3. **MANAGED**
   The condition of infrastructure can quickly deteriorate if the infrastructure is not managed or maintained through its lifecycle. Mismanagement of potable water wells are a common example in northern Ghana. Wells are drilled and fitted with pumps that are not maintained or repaired. Pumps break and the water well cannot be used by the community.
IV. CONSEQUENCES OF NOT USING DATA IN DECISION-MAKING

In the absence of using data to inform decision-making, infrastructure investments are based on political will, informal knowledge, or opinions of decision-makers. One EWB volunteer observed a District planning meeting in early 2010 which was to be used to develop the District’s four year plan. Decentralized government departments such as health, education, and water, presented their priorities and broad proposals based on data. At the end of the meeting, however, the lead district politician presented his own list of specific infrastructure projects, not backed by data.

These decision-making processes are limited in transparency as they are typically not demonstrable or repeatable. The lack of transparency fuels mistrust of the local government structures and development partners, and may negatively impact the level of engagement of a community with its government if community members feel their voice is irrelevant in the decision-making process.

Decisions that are not rooted in evidence can limit the progress of the districts on measured quality of life indicators. Public funds may not be utilized in a way that will deliver the largest return on investment. District Assemblies in partnership with EWB volunteers generated lists of communities and their respective percent water coverage. These lists revealed that some communities were continually prioritized for investment, displaying water coverage of several thousand percent while a large portion of the communities on the list reported a zero percent water coverage. Another example comes from some observations made by EWB volunteers when reviewing education data in the districts where they were working. It seemed that over the past few years, there was an increase in physical school structures, but there was a decrease in overall test scores. This may indicate that simply building the school structure was not addressing the real needs of the education system. However, organizations - both governmental and non-governmental, continue to invest the majority of their education spending in building more school structures as these projects are visible and easily attract donors.

V. CHALLENGES OF IMPLEMENTING DATA BASED DECISION-MAKING

The use of data to inform decisions is a simple concept on the surface, but the implementation of the process can be difficult and complex.

OBTAINING QUALITY DATA

To effectively use data in informing infrastructure investments, a comprehensive data set is required. The examples of quality of life indicators provided previously are useful as part of a snapshot of life in a community, but used as individual data points, they do not capture the broad picture. For example, low school enrollment may be related to poor sanitation and cases of illness rather than a lack of schools. Therefore, it is important that indicators from multiple sectors (health, education, sanitation, etc.) are collected and managed as a set of data that can be used to identify root causes of problems and prioritize infrastructure investments.

Collection of data in northern Ghana is done by a number of different parties for a variety of reasons. Local governments collect data on community infrastructure and quality of life indicators when their budgets and resources permit, but this is usually not a consistent process. Decentralized departments such as health, education, and water use different community references and population data, making it challenging to correlate data across multiple sectors. Development partners are often better resourced to collect data that is used to monitor and evaluate their projects or programs. However, this data is usually sector specific and collected only for the duration of the project.

One EWB volunteer experienced the challenges of collecting data first hand while conducting a full survey of the 200+ communities in a district in Northern Ghana. Physical visits to the communities were required and roads to communities were often nearly impassible even using an off road motorcycle. Communication with communities was complicated by the wide variety of local languages spoken in the various communities, and low literacy rates. Through trial and error, it was discovered that the most effective and consistent way to collect information about a community’s needs and priorities was using a participatory game using stones to vote on pictures of services. Unless funded for special projects or by outside sources, district governments do not typically have resources or time to visit communities regularly to collect data and understand the needs and priorities of the communities.

MANAGING DATA

Raw data alone is not effective for informing decision-making. Data must be collated, formatted, and analyzed to extract information. District governments in Northern Ghana lack both physical infrastructure such as computers and networks, and technical skills such as computer literacy and data analysis, which are required to manage data to obtain valuable information. Although project monitoring and evaluation reports are produced by development partners, the data collected by development partners is often not shared in its raw form with governments or other development partners. It is, thus, not easily managed as part of the broader perspective needed to inform holistic decision-making.

The author of this article assisted one district in collating data from various government departments in order to inform the upcoming four year development planning process. This required physical visits to various government offices located in different parts of town.
and collecting data from different computers in many different formats (i.e., in hard copy, electronic in Microsoft Excel, electronic in Microsoft Office, etc.). Occasionally, computers would be broken or had been corrupted by a virus and the data could not be recovered. Once collected, data was difficult to compare as various departments would report different community populations, use varying age brackets, and much data was missing. Historical data was typically not available dating more than three years back; an insufficient amount to identify trends.

**USING DATA**

Transitioning to a system of consistent evidence based decision-making is difficult when there is not a base of quality data and information established. Decision makers will not trust the poor quality or limited data available, and will use other influences to inform their decisions. This creates a culture in which there is little perceived value in the data, because the quality is always poor. Without a system in place that values data use for decision-making, limited resources are allocated to improving the quality of data or the systems used to collect and manage data in the future. The result is a negative cycle in which data is not valued because it is poor quality, and the quality is not improved because the data is not valued.

The overall result is a large disaggregated amount of collected data with differing formats, timeframes, collection processes, and qualities that are not collated or managed centrally to inform decision-making.

**VI. VISION OF DATA BASED INFRASTRUCTURE PLANNING IN NORTHERN GHANA**

In Ghana, as in Canada, local governments are mandated with the responsibility of delivering basic service infrastructure to their citizens. The size and complexity of the existing asset base varies widely between the two countries, but the vision for the way infrastructure should be delivered and managed is the same. The vision is that projects are planned, prioritized, and implemented in a systematic process which is transparent and sustainable and one that uses accurate information about both current and desired service delivery. Such a process would ensure that citizens are receiving suitable levels of service from their governments and that public money is used efficiently and effectively.

District governments in Ghana need to be in the driver’s seat; owning, managing, and using quality data to understand the current situation in their districts, identify the underlying needs and priorities of their communities, and to inform infrastructure decision-making. This process has the ability to improve local infrastructure delivery to citizens. There are also benefits to development partners collaborating with local governments to collect and manage data.

**TABLE 1. BENEFITS OF DISTRICT ASSEMBLIES MANAGING AND USING DATA IN DECISION-MAKING**

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<thead>
<tr>
<th>DISTRICT ASSEMBLIES</th>
<th>DEVELOPMENT PARTNERS</th>
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<td>Transparent, repeatable, and consistent decision-making process</td>
<td>Ensure and demonstrate non-political nature of projects</td>
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<tr>
<td>Allocation of limited resources to areas in greatest need with the potential for the greatest improvement of quality of life</td>
<td>Transparent, repeatable, and consistent decision-making process</td>
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<td>Facilitate in project prioritization and efficient use of limited resources</td>
<td>Identify the communities with the greatest need (opportunity to have the greatest impact)</td>
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<td>Use data to support project or program proposals to Development Partners</td>
<td>Identify the actual priorities of communities (which are not influenced by the community perception of what services are being offered)</td>
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<td>Efficient knowledge transfer between District Officers (useful for consistently high turnover and staff transfer rates)</td>
<td>Reduce individual project or program data collection efforts</td>
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<td>Resolve community arguments related to allocation of Government resources</td>
<td>Assist in project monitoring and evaluation, especially after the project has finished</td>
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<tr>
<td>Ensure and demonstrate non-partisan nature of projects</td>
<td>Build district government capacities in planning and implementing mandated systems</td>
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**VII. BENEFITS TO COMMUNITIES**

The underlying purpose of improving local government service delivery is to enhance the life of the people being served by the government. When the government uses data and quantifiable information as a basis for its decision-making, the infrastructure investments made have a higher chance of being needed, appropriate, and managed. In northern Ghana, effective investments mean an actual improvement in quality of life in exchange for infrastructure dollars spent.
VIII.
GHANA AND CANADA: OPPORTUNITY FOR SHARED LEARNING?

Upon first impression, asset management procedures and strategies used in Canadian municipalities and Ghanaian districts may appear quite different. However, several of the underlying fundamentals of asset management can be observed in both countries.

1. A defined level of service is required to guide decision-making and prioritization of infrastructure investment, particularly across sectors such as water, sanitation, transportation infrastructure, and education. If a Canadian municipality does not understand the level of service it is aiming to deliver, its success in delivering that service is hard to gauge. Similarly, if a Ghanaian district assembly does not set defined targets for indicators (i.e., no communities with a population greater than 100 and a 0% water coverage rate), it is difficult to prioritize in which areas investments should be made.

2. Data is a critical tool for making and communicating transparent decision-making to stakeholders. Canadian citizens are increasingly demanding data and Open Governance as there is interest in decision-making transparency and the potential of the enormous amounts of data collected to be transformed into useful information. Using data for decision-making in northern Ghana is a first step to increasing transparency, and therefore trust and dialogue with district governments.

3. The use of data for infrastructure investment or asset management is not a simple process; it is a system which requires organizational behavior change. Although there may be some initial quick wins, implementing systemic change in any organization is a long process that requires dedicated leadership. Shifting the organizational culture of a Canadian municipality from reactive to one that is proactive in infrastructure planning and management requires time and money invested to set up sustainable systems. If Ghanaian district assemblies are to transfer to a fully evidence based decision-making process for infrastructure planning, the core prerequisite is a shift in the culture around valuing and using data.

4. Data management tools are effective only if they are appropriate for their users in scope and complexity. Just as expensive software will not solve all of the asset management problems of a Canadian municipality, developing a central electronic database of indicators will not increase data used for decision-making in a Ghanaian district government if basic computer skills are not developed.

While Canadian municipalities are struggling to develop and maintain accurate records of their extensive assets, the Ghanaian local governments have a significantly smaller asset base to start with and have the opportunity to develop asset registers and asset management systems now, as they work to build their asset base. Although not all of the asset management practices and methods of making evidence based decisions in Canada may be applicable to Ghana, several of the challenges to implementation are similar and there may be an opportunity to assess what has been done to implement asset management systems in Canada and analyze where lessons learned may be applicable to successfully implementing systems in Ghana.