

Conclusions and Recommendations

Mapping a Healthier Future: How Spatial Analysis Can Guide Pro-Poor Water and Sanitation Planning in Uganda explores how poverty, water, and sanitation maps can be combined to create new indicators and maps that can inform future investments. Analysis of this information can help to identify regions and communities with greater needs and thereby help to design more pro-poor interventions.

Such analyses are only possible because of the substantial efforts by government agencies to collect relevant data. The Directorate of Water Development at the Ministry of Water and Environment has consistently monitored investments in the drinking water infrastructure allowing them to provide suitable indicators for small administrative areas such as subcounties or parishes. At the same time, the Uganda Bureau of Statistics has been expanding its technical expertise to produce poverty maps for small administrative areas, which requires regular investments in high-quality and geographically referenced censuses and household surveys. The census is a valuable source of data on water, sanitation, and basic necessities (such as clothing, blankets, shoes, soap, and sugar) at subcounty and even parish level.

By integrating and conducting spatial analyses on these data, Ugandan analysts can strengthen water and sanitation investments and poverty reduction efforts. Similarly, given that analysts have the data available to conduct such work, Ugandan decision-makers can demand additional analytical returns for their data investments. The examples presented here illustrate how examination of spatial relationships between poverty, safe drinking water, improved sanitation, and better hygiene behavior can provide new information to help craft more effective—and more evidence-based—investments and poverty reduction efforts.

CONCLUSIONS

The main purpose of this publication is to encourage readers to carry out their own examination of poverty, water, and sanitation maps using the approaches and data sources described here. The process of compiling the data, producing the maps, and analyzing the map overlays has shown that:

- Analysts working with the Uganda Bureau of Statistics, Directorate of Water Development (Ministry of Water and Environment), and Health Planning Department

(Ministry of Health) can combine poverty maps with maps showing water, sanitation, and hygiene data (at subcounty level).

- From these map overlays, analysts can create new indicators and maps juxtaposing levels of poverty with levels of water and sanitation coverage.
- Analysts can use these indicators and maps to select geographic areas with specific poverty, water, and sanitation profiles for pro-poor targeting.
- Decision-makers can use these new indicators and maps to make more informed and transparent choices when prioritizing investments in water and sanitation efforts.

While the maps and analyses in this report are primarily illustrative in nature, they support the following conclusions:

Maps showing water and sanitation indicators at the subcounty level can highlight geographic differences in the achievement of national targets. This information is useful for planners at the district and national levels to identify disadvantaged areas and examine equity issues.

- ***Rural safe drinking water coverage:*** The performance of subcounties in achieving safe drinking water coverage is mixed, without any clear spatial patterns. About 11 million people live in the 323 subcounties that have not kept pace with the progress made at the national level.
- ***Improved sanitation coverage:*** There are strong geographic patterns, with lower coverage in northern and eastern Uganda, and higher coverage in central and southwestern parts of the country. Approximately one third of Uganda's rural subcounties (278), representing 6.2 million people or one quarter of the rural population, had not reached the rural target established for the first Health Sector Strategic Plan (HSSP I) by 2002.

Combining map-based census data related to water, sanitation, and hygiene can guide more integrated campaigns to decrease the incidence of waterborne diseases.

There is valuable information in the census that can be combined to gain insights and plan more integrated safe drinking water, sanitation, and hygiene efforts.

Poverty maps and maps of water and sanitation indicators can provide insights into the relationship between poverty, water, and sanitation.

- *Rural safe water coverage versus poverty levels:* There is no clear spatial relationship between levels of water coverage and poverty for the rural subcounties examined in this publication.
- *Improved sanitation coverage versus poverty levels:* Rural subcounties with higher poverty levels are associated with lower sanitation coverage rates. About half of the variance between these two variables can be explained by poverty rates. Other factors (not examined specifically in this publication), such as hygiene awareness, interest, and geology most likely contribute to the association as well.

The overlay analyses of poverty, water, and sanitation maps presented are most useful for identifying subcounties with similar poverty, water, and sanitation characteristics to guide geographic targeting.

- *Pro-poor targeting to improve rural safe drinking water coverage rates:* To identify rural subcounties optimal for pro-poor targeting requires careful examination of three poverty metrics: poverty rates, poverty densities, and the total number of poor people. In general, rural subcounties with high poverty rates and a high total number of poor are prime candidates for pro-poor targeting of drinking water investments.
- *Pro-poor targeting to boost rural improved sanitation coverage rates:* More densely settled and better-off rural subcounties were the first to achieve the HSSP I target and generally have higher average coverage rates of improved sanitation. Focusing future sanitation and hygiene interventions on rural subcounties that have fallen behind national milestones will provide two benefits: it will reduce inequities in access to improved sanitation and will contribute to Uganda's poverty reduction goal. The map overlays presented here identified three major types of rural subcounties reflecting similar poverty rates, poverty densities, and improved sanitation coverage levels. These three profiles could be used to tailor efforts to stimulate demand for improved sanitation and hygiene and target subsidies to construct sanitation facilities.

RECOMMENDATIONS

The primary objective of this publication is to highlight ideas on how census and poverty maps can be combined with water and sanitation data to produce new indicators and maps. But it also seeks to catalyze new and improved analyses and greater use of the resulting information in decision-making. Central and local government agencies can increase the likelihood of this by intervening on the supply side to make available more and better information,

and on the demand side to increase the use of these maps and analyses in government planning.

Strengthening the supply of high-quality data and analytical capacity will provide broad returns to future planning and prioritization of water, sanitation, and poverty reduction efforts. Priority actions to achieve this include:

- **Fill data gaps on sanitation and hygiene indicators; regularly update water, sanitation, and hygiene data; and continue supply of poverty data for small administrative areas.**

Future planning could be improved with the more precise sanitation data from the Ministry of Health, especially if they are available for small administrative areas and updated regularly. The proposed new key indicators for sanitation and hygiene promotion outlined in the National Environmental Health Policy will fill an important data gap and enhance planning and annual performance reviews. The regular update of detailed poverty maps is essential for tracking progress of poverty reduction efforts and to continue pro-poor targeting of resources, both for central and local government institutions.

- **Strengthen data integration, mapping, and analysis.**

Compared to the financial resources spent on data collection, fewer resources have been earmarked to analyze and communicate the data from the various sources explored in this publication. The in-house technical and analytical capacity within the Ministry of Health, Ministry of Water and Environment, and other government institutions to extract, map, interpret, and communicate these data requires strengthening through regular and focused training.

Promoting the demand for such indicators and spatial analyses will require leadership from several government agencies. Actions in the following four areas carry the promise of linking the supply of new maps and analyses with specific decision-making opportunities:

- **Incorporate poverty information in water, sanitation, and hygiene interventions and in regular performance reporting for the water and sanitation sector.**
 - This publication provides examples of how poverty maps can enrich analyses for the water and sanitation sector and lead to more precise geographic targeting. Follow-up analyses by the Directorate of Water Development (Ministry of Water and Environment) and the Health Planning Department at the Ministry of Health can build on these examples and include other variables (reflecting costs, efficiency, equity, etc.) that are relevant to prioritizing water, sanitation, and hygiene interventions. This would increase the likelihood that efforts to reach Uganda's 2015 water and sanitation targets continue to be pro-poor.

- Institutions in the water and sanitation sector should work closely with the Uganda Bureau of Statistics and the Ministry of Finance, Planning and Economic Development to discuss the pros and cons of different prioritization criteria assuming they have continued to build a solid information base (for national and local planners and representatives of local communities).
- Performance reporting for the water and sanitation sector would provide more comprehensive and decision-relevant information if data from the new poverty maps were incorporated. Future reports, for example, could include a poverty profile for the communities reporting changes in water and sanitation coverage rates.

■ ***Incorporate water, sanitation, and hygiene behavior information into poverty reduction efforts.***

Improved sanitation, safe drinking water supplies, and better hygiene behavior all affect well-being, livelihoods, and economic development. Strategic investments to improve environmental health could provide broad benefits reaching far beyond the water and sanitation sector. The Ministry of Finance, Planning and Economic Development could collaborate with the institutions in the water and sanitation sector to identify communities that are near a critical threshold where additional investment could bring widespread health benefits at the community level. Such a threshold could be defined by the community's current level of improved sanitation and other community indicators reflecting drinking water sources and hygiene behavior. Based on such an assessment, district and local communities could then work with the Central Government to lobby for changes in recurrent and development budgets (both from the Central Government and District Local Government). These new funds could be used to design geographically targeted campaigns to boost coverage rates and improve hygiene behavior in priority communities.

■ ***Promote more integrated planning and implementation of water, sanitation, and hygiene interventions.***

The short example in Box 8 demonstrates how combining water, sanitation, and hygiene indicators could result in new map overlays and more comprehensive analyses. Similar analyses incorporating data from various sectors should become a regular tool to plan more integrated interventions. Such an approach could help to make more efficient use of government and community resources and achieve greater health and well-being impacts. Districts in southeastern Uganda—because of their poverty, water supply, and sanitation characteristics—would be ideal for testing such an integrated approach.

■ ***Incorporate poverty maps and maps of water, sanitation, and hygiene indicators into local decision-making.***

The underlying data and maps discussed in the previous section are in most cases detailed enough to be useful in local decision-making. However, many local decision-makers still have difficulty accessing these data, conducting such analyses, and applying the findings to planning exercises. Initially, the Health Planning Department at the Ministry of Health, the MIS/GIS Unit at the Directorate of Water Development at the Ministry of Water and Environment, and the GIS unit at the Uganda Bureau of Statistics could provide technical and analytical support to a few pilot districts and incorporate poverty information into the design of future water, sanitation, and hygiene interventions. Later, such support could be given to all districts through ongoing and planned local government capacity building programs. In the same breath, it is recommended that the Ministry of Health integrates spatial analysis in the Health Management Information System (HMIS). The system should permit mapping of parish, subcounty, and county data (for analysis within a district) as well as mapping of district and regional data (for analysis at the national level).



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