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VoR (Version of Record)

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REPOSITORY RECORD

Masso, Michael, Alan Kakwezi, and Francis Ndahula. 2019. "Geographic Information Systems for Rural Water Supply Management". figshare. <https://hdl.handle.net/2134/28908>.

MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

Geographic Information Systems for Rural Water Supply Management

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Geographic Information Systems (GIS) are databases linked to digital maps. Many public and private sectors in Uganda have begun using GIS technology to facilitate more effective analysis, planning, and management. The Bundibugyo District Water Office, in collaboration with the Directorate of Water Development (DWD) and World Harvest Mission (WHM), has actively applied this technology to the area of water resource management. We are currently updating and compiling a database of all water sources. We will then begin producing relevant charts and maps. The end goal is to translate this information into effective action for the operation and maintenance of existing water supply systems and informed planning of future systems.

Background

Many public and private sectors in Uganda have begun using Geographic Information Systems (GIS) technology for management and planning purposes. A GIS consists of data linked to a digital map. In 1997 the Forestry Department completed a nation wide digital mapping and GIS project to study biomass and land use. Since that time, the digital base map has been made available for other sectors to use.

In 1999 the Directorate of Water Development (DWD) began a GIS project to map all water sources in the country. This is part of a plan to monitor progress in meeting water supply goals. The maps and database can also be used to improve the management of existing systems and to plan effectively for future systems. The project is intended to be continually updated.

In an effort to decentralize the process the DWD is providing training, software, and technical support, but giving districts the responsibility of collecting, analyzing, and using the relevant data.

Proposal

We propose to share our experience in the Bundibugyo District Water Office with the process of using the GIS technology for water resource management and planning. In collaboration with an NGO, World Harvest Mission (WHM), we are developing a variety of high quality maps and GIS products which will be very practical for management and planning purposes.

1) Compiling Quality Data-

The raw data collection involves using subcounty extension staff equipped with GPS units to mark the location of every existing water point. At the same time, data is collected about the construction, operation, and maintenance of the water

Project Phases

- Compiling Quality Data
- Producing Useful Maps and Charts
- Analysis Leading to Intelligent Action
- Cross Sector Sharing

point. All this data must then be entered into a computer database, verified, and checked for errors. Additional data is also compiled from various sources- population figures for instance. Here the Uganda Bureau of Statistics and other national and local government sectors have opportunity to collaborate by sharing information. The foundation of any GIS project is quality data. The well known formula: garbage in – garbage out is very applicable here. The raw data must be accurate and complete if the project is to be a success.

2) Producing Useful Maps and Charts-

The effectiveness of a GIS project depends on the ability to organize, present, and analyze the data collected. We propose a variety of high quality maps, charts, and tables that will be relevant and useful. These may include the following products:

- Large maps of subcounties and parishes showing both locations of existing water points and population densities. These are clearly useful for quantifying existing water coverage and for planning future water systems.
- Technical drawings of existing GFS systems- crucial for the maintenance and extensions of such systems.

- Tables and Maps summarizing operation and maintenance issues in a way that facilitates intelligent actions in this vital area.
- Historical maps showing the progressive development of water coverage and population, as well as future projections indicating anticipated population growth and water supply targets.

3) Analysis Leading to Intelligent Action-

As implied in the previous section, these maps are not to provide interesting amusement. They are intended to result in intelligent action for the supply of safe drinking water to the population. Therefore the goal of the entire process is to translate the information into effective action. How will we address the issues of maintenance and sustainability? Which areas are most desperately in need of water supply? Which technologies will be most effective? What kind of training, planning, or policy adjustments will improve our ability to supply safe water?

4) Cross Sector Sharing-

GIS technology requires sharing of information and has already done much to improve collaboration across sector lines. We should continue to look for creative ways to involve all stakeholders and share our experiences. There may be ways to involve various government sectors, NGOs, private sector, and community at large in using GIS in other ways. The technology can be applied to improving health, education, infrastructure, and any other services.

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