Uganda's water sector information system

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UGANDA GOVERNMENT HAS decentralised its functions, powers and responsibilities from central to lower local government and brought decision making close to the people involved. In response to these changes, UNICEF with funds from Sida, as part of the on-going effort to improve the water and sanitation situation, in 1997 assisted the government in setting up a management information system for water and sanitation to enable informed decision making by local councils. Communities were trained to collect and use data with summaries sent to higher level political and administrative offices. Later it was realised that the political offices could not adequately interpret data and a Geographical Information System was introduced to provide spatial information in the form of maps. The response from local governments has been overwhelming as disparities within the district are easily displayed. This has led to under served communities demanding a more equitable share of resources and has contributed to rational decision making. It has further motivated communities to strive harder to improve as they are now able to compare their situation with that of their neighbours. The challenges for the programme are to further improve on data usage at all levels, build in systems for updating and to decentralise data processing. This paper traces the implementation strategies of the GIS project, constraints, opportunities, financial costs, lessons learnt and future challenges.

Background

Despite the progress made in recent years, Uganda still has among the lowest water and sanitation coverage in the world. In a countrywide study and analysis of the situation of children and women in Uganda, it was established that poor hygiene and sanitation practices, compounded by low levels of access to safe water and a poor living environment

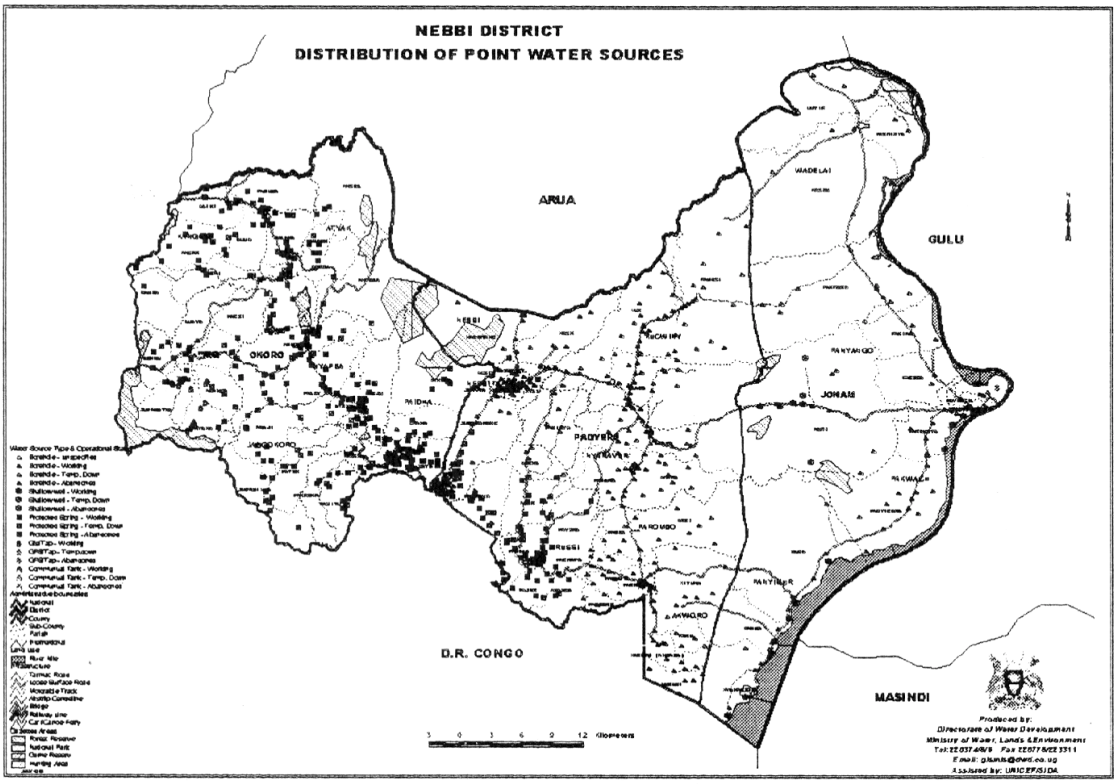

Figure 1. Nebbi district distribution of point water sources

are among the major causes of childhood illnesses. As a component of the on-going effort to improve the water and sanitation situation in Uganda, UNICEF with funds from Sida in 1997 assisted the government in setting up a Management Information System for Water and Sanitation (WSS-MIS/GIS) to enable informed decision making. The objective of the information system was to create management tools for planning and monitoring of water supply and sanitation development at both local and central government in accordance with the decentralisation policies. The system was set up to generate data and tools which show progress and trends over time, simplify analysis, facilitate comparison between regions/districts and provide spatial distribution patterns. The availability of information is vital for rational decision making and realisation of 1) Efficient mobilisation and allocation of resources, 2) Equitable distribution of sources, 3) Increased efficiency in operation and maintenance and 4) Improved accountability

Local government structure

In a district there are five levels of government (district, county, sub-county, parish and village level), that is Local Council 5 down to the lowest level, Local Council 1. A District Steering Committee of LC5 politicians is responsible for the formulation of water development targets in line with national policies, implemented through the district and sub-district administration The entity responsible for planning and monitoring of district water development is the District Management Committee consisting of technical officers. At sub-county level the sub-county needs are identified by a Water and Sanitation Committee and the requests forwarded to the District Management Committee.

Project strategies and implementation

Strategy

The initial activity of the WSS-MIS was to establish a reliable base-line data. In order to simplify analysis and interpretation of coverage figures etc., a Geographic Information System was added. The technology used for the GIS is Global Positioning System (GPS) which consists of a constellation of 24 navigation satellites that orbit the earth twice a day and transmit signals. By picking up the signals from the satellites with a GPS receiver, the location on earth is determined. The project strategy is to map safe water sources and institutional sanitation by using modern GPS technology and strengthening and taking advantage of the existing local government structure. To ensure sustainability, widespread utilisation and financial backup, people at different levels, nationally and in the district have been involved. The responsibility of data processing and overall management of the project is placed centrally at the Monitoring and Evaluation unit at the Directorate of Development (DWD) under Ministry of Water Lands and Environment whereas the districts have the responsibility for data collection and supervision. The ideal situation is that all district will be able to handle all steps themselves and therefore a decentralisation of the GIS lab has been initiated this year.

Implementation

In 1998 a consultant was hired to analyse computer and software capacity at DWD, identify capacity gaps and make a plan to fill the gaps. The consultant further had the responsibility to draw up a strategy and cost the data collection in the districts, design instruments for data collection, train DWD staff and finally set up a system with database and linkages to mapping software. The gaps at central level were identified, software and hardware and basic topographic map layers (with administrative boundaries, lakes, forests and road network) were bought and training materials developed. The cost of setting up the GIS lab at national level was about $60,000 for consultant fees, $31,000 for equipment and software[1] and map layers of about $14,800[2]. Further the yearly operating costs of at least two full time staff and consumables need to be included in the calculations. Staff at DWD were trained how to handle the GPS machines and to train district staff. When the training was completed, implementation in 5 pilot district was initiated from which experiences were drawn. The project has after that been expanded to cover the whole of Uganda. The phases of the GIS are the following, 1) Pre-visit and district training, 2) data collection, 3) data processing, 4) data validation 5) official map and data production, 6) up-date. After a meeting where district staff is briefed about the project and a time scheduled agreed upon, two national officers train district technical staff and county supervisors on map reading, data collection forms, use and handle of the GPS machines, supervision and data validation. The training takes two days after which the newly trained supervisors in turn train the surveyors (one extension staff from each sub-county) for 2-3 days supported by national staff. As the district staffs are the ones training the data collectors, they have to aquire the skills themselves and internalise the concept and it has proved to be an excellent way of building up capacities and creating ownership. When the training is completed about 25 people in a district have the skills needed for data collection. The surveyors collect data on safe water sources and institutional sanitation in health centres and primary schools for their own sub-county. When the project started, around 660 bicycles were distributed to the 34 districts to enable extension staff to cover larger areas.[3] Given their local knowledge on what is on the ground, the data becomes of very high quality. The extension staff is supposed to do this as part of their regular work and are hence only paid little to cover lunch. They are given 11 days to collect the data and after that submit the data to the supervisors who check it and if errors are detected, the surveyor is requested to go back and correct. In total the training and data collection phase generally takes about 4 weeks (at a average cost of $ 4500) after which the data is sent to DWD for processing and draft map production, taking one person

about 2.5 weeks of fulltime work. When the processing is finished, a central system validation is run where invalid data records depending on their location on the maps or missing data fields are identified. The feedback is given at a validation meeting held in the district, where technical staff politicians and/or administrators from each sub-county meet to further scrutinise and agree on the data. This exercise has proved crucial for the active use of the data and for official recognition and data incorporation in district and sub-county plans.

Achievements, constraints and lessons learnt

After its successful piloting, the GIS project was expanded and up to this date (April 2001), 22 districts (about half the country) have been mapped by DWD and UNICEF and 12 more is scheduled for this year. In addition to these, 10 other districts have been covered by another project. The GIS has proved to be extremely useful at higher central levels for policy making and overall distribution of funds. A significant impact has also been found in the districts where the GIS data is used actively in the discussion between technical staff, administrators and politicians and have helped them in reaching consensus and direct resources to the areas that are worse off. The data is also used in discussions with NGOs and donors and have helped in mobilising resources for the water sector. The magnitude of the impact on disparity reduction will become more clear after the data update where the change in distribution pattern can be traced. The utilisation of data has also played a role in advocating for rehabilitation of water sources, especially for areas where there are few alternative options. One of the constraints the project has faced is that the number of the districts that can be trained at the same time is limited by the number of GPS machines available. As the surveyors preferably should do the data collection directly after the training, they need as many GPS as there are sub-counties. The total amount of GPS purchased was 70 and the amount of sub-counties per district is between 14-40. The districts have also with few exceptions delayed with returning all the GPS as they want to keep a few for up-date etc. and it has been a struggle to retrieve the machines. Other constraints have been the administrative procedures for release of funds required to carry out the training and data collection.

Nebbi district experiences

After the validation exercise, the data usage at district and sub-county level has been followed up on. The technical staff in Nebbi find the WSS-MIS/GIS data very useful and use it actively at the District Management Committee meetings. One of the major benefits stated is that the data and maps have generated discussions between politicians and technical staff, improved understanding and given a rationale for allocation of resources.

> "WSS-MIS/GIS data has greatly improved the understanding of both the policy makers (politician) and the implementers on issues concerning water placing and generated effective tool for Planning and Management of water sources and supply in the District. This data however, needs regular update to cope with the changes in the geological development in terms of water sources…"
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> *Orombi J.P Charles, District Planner Nebbi*

The technical staff has explained that before the data and maps were available, the investment did not always go to the sub-counties that needed it most as it was difficult to agree on what was actually on the ground. Recently when the district planned for the use of the Equalisation Grant, the WSS-MIS/GIS data was used and it was decided that the water sector need attention. Therefore out of UgX 120 million ($71,200), 70 million went to the water sector ($41,500). The majority of the funds were used for rehabilitation of boreholes and the rest for shallow wells and specific attention was given to Jonam county and to Panyango Sub-county, especially to Alwi parish in which the water situation is critical. The analysis of the data has also led to redistribution and construction of latrines. The original district plan was adjusted and the 43 latrines planned were redirected to areas that needed it more. The data is further used at the intra-district advocacy meetings where the sub-counties come together and in the discussions with NGOs to decide on areas of intervention.

Future challenges

Despite the achievements there are still challenges such as improved data usage at lower levels to enhance the culture of rational decision making. Year 2001 there will be an on-going effort in assisting the districts to publish the data and include it in their district- and sub-county development plans. Other challenges are to strengthen the systems for data update in the district Planning Offices and start the decentralisation of data processing in the 10 pilot districts.

References

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i (70 GPS machines, 2PC computers, 2 voltage stabilisers, 2 UPS, 1 Desk Jet colour printer 1120 , 1 Desk Jet printer, 1 HP plotter, 2 licenses Arc View 3.1, 1 Arc view Spatial Analyst Module, 2 External parallel Iomega Zip drive, Zip diskettes, CD room disks).

ii 25 Million Uganda Shilling ($=1685).

iii The cost of bicycles might be cost shared with other projects, if not this component must be budgeted for.

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