

MAKERERE
P. O. Box 7062
Kampala, Uganda
Plot 56, Pool Road



UNIVERSITY
Phone: +256-414-540628/
Fax: +256-41-540620
E-mail: info@cis.mak.ac.ug
Website: www.cis.ac.ug

COLLEGE OF COMPUTING AND INFORMATION SCIENCES

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PRESS RELEASE

A MOBILE-BASED EARLY WARNING SYSTEM FOR MONITORING WATER LEVELS IN VALLEY DAMS

Researchers from the College of Computing and Information Sciences have designed a mobile-based system that monitors water levels in valley dams located in drought affected areas in Uganda. This system provides an early warning system to concerned district authorities who can in turn alert the farmers in advance. Having monitoring and early warning systems provides timely information on the formation, development and persistence of drought. This helps the district authorities and the Ministry of Relief and Disaster Preparedness prepare for drought periods by having reservoir wells constructed across the districts in the cattle corridors.

The development of the Mobile-based Early Warning System will go along way in helping livestock farmers in Uganda to overcome challenges like drought, climate change, flooding, and water shortage ignorance about rain water harvesting and lack of up to date information about water levels in the various dams. It has been a common occurrence that most dams in Uganda are not monitored therefore creating a void in data pertaining to the availability of enough water for the animals or when the valley dams need to be refilled during the dry seasons. This causes loss of lives of cattle hence low production of milk and meat contributing to the problem of malnutrition among the populace. The College hopes to partner with institutions like the Ministry of Relief and Disaster Preparedness (MORDP) and other development partners to ensure that this innovation is widely applied in several areas of the dry cattle corridors.

The system, which consists of a sensor, a data processing module, communication medium and central station, uses GSM-based (Global-System for Mobile Communications) technology to deliver information in the form of short text messages (SMS) to recovery officers at the district both in cattle corridor areas and settlement areas. A sonar sensor was deployed to interpret the sound waves in the valley dams and it calculates the time interval between sending the signal and

receiving the echo to determine the level of the water. When the water level signal is acquired through the sensor, this information is transmitted to the data processing module via wireless communication. The data processing module converts the analog signals received into digital signals and then prepares messages for data telemetry purposes. These messages are sent as SMSs over the GSM network to the database where they are stored and sent to the concerned authorities upon detection of fluctuations in the water levels. In addition, the system can detect potential threatening conditions and notify MORDP offices or initiating data transmission to a remote location for further analysis, plot water level information on GIS Maps and allow the generation of reports.

The system uses a sonar sensor because it is cheap and easy to deploy in a GSM-based system, and it can be deployed in areas where wiring is impossible thus making this innovation a suitable and affordable technology for deployment in the valley dams countrywide.

With this innovation, the cattle keepers can receive timely information about available water in valley dams and also request for information about valley dams with available water while the concerned authorities like the Ministry of Relief and Disaster Preparedness can continuously monitor and interpret water level data and thus ably respond in case of a water shortage.

The system was developed by Seth Muhairwe as part of his research leading to an award of a Masters Degree in Data Communication and Software Engineering during Makerere University's recent graduation ceremony. Muhairwe focused his research on the following dams located in *Kiruhura* District: *Kazo, Kiruhura, Mugore, Kachumbiro and Ishagam*. He was supervised by Dr. John Quinn from the College of Computing and Information Sciences, Makerere University.

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For more information please contact:

Seth Muhairwe: Principal Investigator - smuhairwe@cit.ac.ug, 0702-847660

Maria Roselynn Muzaaki: Communication Officer – pr@cis.mak.ac.ug, 0776-282421