



STUDY NAME

Use of remote sensing and terrain modelling to identify suitable zones for manual drilling in Africa and support low cost water supply

RESEARCH ORGANISATIONS

University of Milano-Bicocca (UNIMIB) (Italy), University Cheick Anta Diop (UCAD) – Dakar (Senegal), Service Nationale de Points d' Eau (SNAPE) – Conakry (Guinea), School of Mines (SMB) - Boke' (Guinea), UNICEF Senegal, UNICEF Guinea (for dissemination and coordination with promotion of manual drilling programme)

RESEARCH TEAM

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RESEARCH AIM / HYPOTHESIS

The main goal of the proposal is to explore the potential of different types of remote sensing and terrain modelling to improve understanding of shallow geology and potential aquifers for manual drilling - and to improve current maps of suitable areas for manual drilling.

The proposed research aims:

1. *to contribute to a better methodology for the characterization of shallow geological conditions integrating innovative sources of indirect data;*
2. *- to produce more detailed manual drilling suitability maps in the selected areas, with the goal of supporting the implementation of manual drilling construction program.*

STUDY DESCRIPTION

UNICEF, as part of its mission to improve access to water, is promoting manual drilling throughout Africa with different activities: advocacy, mapping of suitable zones, technical training and institutional support.

Manual drilling refers to those techniques of drilling boreholes, for groundwater, using human or animal power (not mechanised equipment).

These techniques are well known in countries where the surface geology is relatively soft and unconsolidated. Manual drilling is cheaper than mechanically drilled boreholes and easier to implement because the equipment can be made and repaired locally.



However, manual drilling is feasible only where hydrogeological conditions are suitable (shallow layers not too hard and groundwater not deeper than 25 m). Therefore, by identifying and mapping areas that are likely to be suitable will save a lot of time and effort.

A method for finding suitable zones at country level has already been applied in 15 African countries, based on the analysis of existing hydrogeological data and geological maps. However an better approach is needed to provide more detailed suitability maps. This would support the implementation of regional-scale of manual drilling programs.

This project will integrate multi-source remote sensing data (optical, thermal and radar), digital terrain models, databases of water points, stratigraphic logs, and field geophysical surveys on manually drilled wells. An improved methodology will developed using this information in two study regions located in Guinea and Senegal.

The research aims to find out how useful and accurate remote sensing information is for obtaining information about subsurface hydrogeology. It will develop a method for using satellite data to estimate areas where manually drilled wells are likely to be successful. This is especially needed where borehole and wells data are not available.

Ultimately, the goal is to increase the effectiveness of manual drilling programs so that boreholes they create can provide a reliable, accessible water supply for impoverished households and communities.



WHERE TO FIND OUT MORE:

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