



**OPERATIONAL
RESEARCH
SNAPSHOT**

Diagnosing and Rehabilitating Boreholes in Rural Niger



Clean water in sufficient quantities is becoming increasingly scarce in many regions of the world, particularly in developing countries. Providing sustainable sources of drinkable water is a major concern for vulnerable communities and health actors alike, and is crucial for people's nutrition and health.

Regions with scarce water resources often depend on boreholes tapping into the groundwater supply. Traditionally, damaged or dysfunctional boreholes are abandoned and new ones are drilled – an often expensive and time-consuming procedure.

In the Guidan Roumdji district of Niger, Médecins Sans Frontières piloted and evaluated a new approach rehabilitating 31 dysfunctional or contaminated boreholes instead of drilling new ones. An operational research study evaluated the types of borehole damage or contamination, the rehabilitation measures taken, and the related costs.





The project equipped a vehicle with a submersible camera, a data logging probe, a spectrometer, a compressor, pumps and brushes. With this mobile workshop and the help of local workers, 50 boreholes were diagnosed between 2013 and 2015 – and 31 (62%) were rehabilitated.



Problems found included broken casings, obstructed pipes, and defective pumps, but also contamination of the water. At one borehole, the potentially harmful fluoride content of the water was reduced by sealing a section of the borehole at 46 meter depth.



Rehabilitating boreholes proved feasible and highly cost-efficient at only 2 USD per beneficiary compared to an estimated 30 USD for drilling new boreholes. The project also led to a better understanding of the region's groundwater supply and quality for future drilling initiatives.



IMPLEMENTATION

The programme involved national engineers who have been continuing the programme in the Guidan Roudji region. Up-scaling and application in other parts of the country are under consideration.

MSF has started to apply the concept in recurrent cholera and typhoid outbreaks in Zimbabwe, and founded the Groundwater Oriented project (GO pro) – a standalone operational capacity for borehole rehabilitation and construction.

Original Study: Mamado, Z.; Nuttinck, J.; Faure, G.; Van den Bergh, R.; Huggin, M.; Magagi Dadin Kowa, B.; Razak, A.; u Badjé, A.; Etienne, W.; Dongiovanni M.; Maes, P (2017) Borehole diagnosis and rehabilitation as alternative to new borehole drilling – the Médecins Sans Frontières approach in rural Niger. Submitted to PLOS ONE, under review.

Pictures: Guillem Valle/MSF, Juan Carlos Tomasi/MSF, Tanya Bindra/MSF



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