

35th WEDC International Conference, Loughborough, UK, 2011

THE FUTURE OF WATER, SANITATION AND HYGIENE:
INNOVATION, ADAPTATION AND ENGAGEMENT IN A CHANGING WORLD

**Professionalizing manual drilling in Africa:
a complimentary strategy to achieve the MDG water target**

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BRIEFING PAPER 1070

The Millennium Development Goal target to halve the proportion of people without sustainable access to safe water by 2015 is unlikely to be met in sub-Saharan Africa. Consequently, there is a need to develop and implement complimentary strategies to conventional approaches to water service provision, especially in rural areas which have the lowest coverage and are most off-target. One such approach is the utilization of manual drilling; however, for this to have significant and sustained impact it is essential that manual drilling be professionalized. This paper outlines the capacity building process required to professionalize manual drilling and ensure that it can make a significant contribution to providing safe water to rural un-served populations. This process includes thorough assessments of sector stakeholders, policies and the physical environment, and the identification, training and certification of drilling enterprises and associated business. The paper also introduces the manual drilling toolkit for use by country-level practitioners.

Introduction

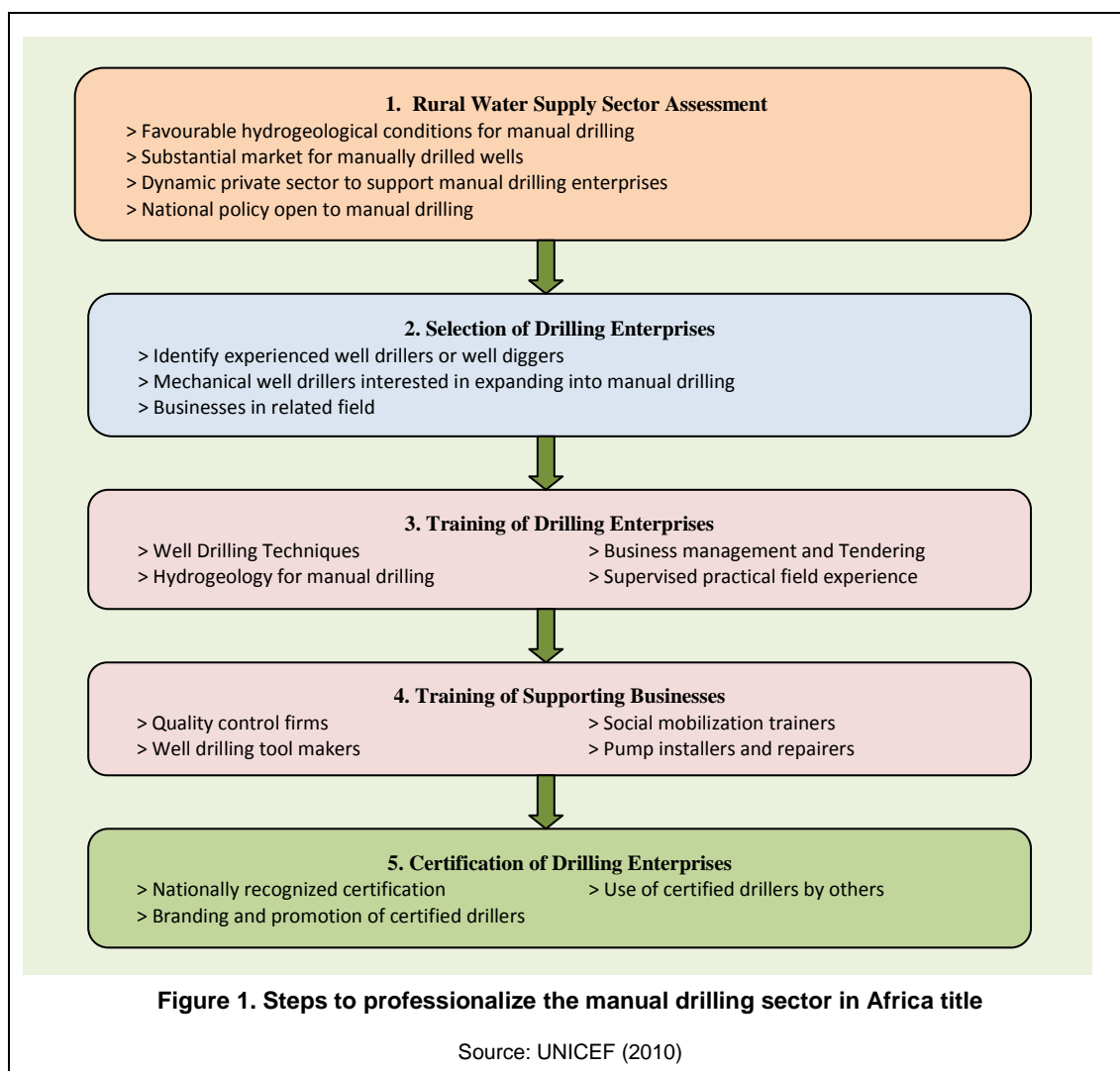
The Millennium Development Goal (MDG) target to halve the proportion of people without sustainable access to safe water by 2015 is unlikely to be met in sub-Saharan Africa, which has the lowest coverage of any region of the world (WHO/UNICEF, 2010). Groundwater has proved the most reliable resource for meeting rural water demand in sub-Saharan Africa (MacDonald & Davies, 2002), however, the current rate of progress via conventional water supply drilling programmes is insufficient. There is, therefore, a critical need to adopt alternative complimentary strategies. One such strategy is the promotion of manual drilling; this has the added advantages of low-cost (it is 4-10 times less expensive than machine drilling in Africa), and increased accessibility, whereby it can reach areas unlikely to be served by conventional mechanized drilling operations. In recognition of its contribution to reaching MDG target 7c, manual drilling has been included as one of the MDG Good Practices 2010 by the United Nations Development Group (UNDG).

In 2010, the Rural Water Supply Network (RWSN) published a *Code of Practice for Cost-Effective Boreholes* which outlines nine principles. Among these are the following: construction of boreholes and supervision is undertaken by professional and competent organizations which adhere to national standards and are regulated by the public sector; the construction method chosen for the borehole is the most economical, considering the design and available techniques in-country; procurement procedures ensure that contracts are awarded to experienced and qualified consultants and drilling contractors; and the borehole design is cost-effective, designed to last for a lifespan of 20 to 50 years (RWSN, 2010). This code of practice recognizes the contribution that manual drilling can make in terms of cost-effectiveness, but also highlights the need to professionalize the sector and ensure appropriate policy and regulatory instruments.

In recognition of this need, UNICEF, Practica and Enterprise Works/VITA (a division of Relief International) have developed a toolkit for African countries wishing to embark on the professionalization of manual drilling. This initiative builds the capacity of the local private sector in order to respond to the ever increasing demand for safe water in rural areas.

Steps to professionalize the manual drilling sector

The process to professionalize manual drilling consists of five key steps and is outlined in Figure 1. It is important to recognize that this is a capacity building process rather than a drilling programme. Each of these steps is summarized in the following sections.



Rural water supply sector assessment

The rural water supply assessment will establish the potential for manual drilling and will provide an analysis of the rural water sector and a summary of the roles of the various actors and how their interests relate to manual drilling. The first step is to map favourable zones for manual drilling based on geological, geomorphological and hydrogeological data (see Figure 2). Assuming that significant potential is identified, this is followed by a stakeholder analysis which considers government agencies, Non-Governmental Organizations (NGOs), donors, machine drillers, well diggers, manual drillers, social mobilization organizations, quality control structures and pump suppliers, manufacturers and repairers. An assessment of the policy environment, technical standards and quality control mechanisms is also undertaken.

Information obtained during the assessment will inform the development of social marketing instruments tailored to the different interest groups. It will be necessary to raise the awareness of the government, donors and other key players in the sector as to how they can benefit from the creation of a strong manual well drilling sector. The assessment will also provide the data for the initial identification and recruitment of well drilling enterprises, quality control firms and social mobilization organizations. The initial lists will be used to assess the viability of the different enterprises to participate in the programme and their training needs.

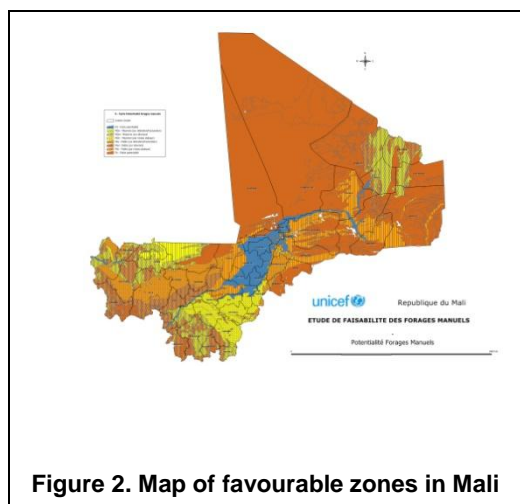


Figure 2. Map of favourable zones in Mali



Photograph 1. Percussion drilling in Mali

Selection of drilling enterprises

During the stakeholder assessment it will be determined whether or not, and to what extent, manual drilling exists already. It will also identify current and potential manual well drilling companies. On this basis, the most promising should be requested to submit supporting documentation including bank statements, company registration documents, qualifications of staff and a list of wells drilled with well logs and location, date of installation and client contact information for references.

The exact criteria for selecting manual drilling enterprises will be determined by the prevalence of manual drilling in the country. Ideally, for a business to be included in the capacity building programme they would have at least 5 years experience manually drilling wells, formal registration as a company (or the willingness to register), necessary drilling and well development equipment (or a willingness to invest in such equipment), necessary support equipment including cell phones and means of transportation, a bank account (or willingness to open one), a literate and numerate owner or manager, and qualified well drillers with 3 or more years of experience. However, it is recognized that it is likely that in most countries it will be difficult to find businesses that fulfil all of these criteria, but if there are enough businesses with most of them, the capacity building programme can be designed to address the weaknesses.

Training of drilling enterprises

Once the businesses have been identified a training needs assessment should be conducted to determine the gaps in their understanding. Experience has shown that generally a combination of practical training on drilling techniques combined with theoretical geo-hydrology and business training will be needed. Experienced drillers will be able to understand the applicability of the geo-hydrology training and can be offered this training before upgrading their practical drilling techniques. However, for enterprises that have never drilled wells before, the first step will be to teach them to use the equipment to drill holes in the ground. Once they are familiar with the tools and the basic drilling operation they will be better able to appreciate the theoretical training and better able to apply the lessons learned when they return to the field.

Training of supporting businesses

In addition to building the capacity of manual drilling enterprises, it is important to ensure that all of the supporting organizations (consulting firms, NGOs, businesses, government bodies, etc.) have the capacity to fulfill their roles. This includes trainers (business and hydro-geology), workshops to make the drilling tools, quality control firms, social mobilization organizations, social marketing/marketing companies and financial institutions. It is not a question of creating these supporting businesses, but providing them with specialized training to ensure that they have the skills needed to support the growth of the manual drilling sector.

Certification of drilling enterprises

Following completion of the training program successful businesses should receive certification from the government agency responsible for overseeing well drilling. Certified manual drilling enterprises may

benefit from forming an association. This should not be something that is externally required, but facilitation and training could be provided. There must be perceived benefits that members will receive from the association. It is important to recognize that an association will only work as long as the members see tangible benefits from associating such as: promoting their industry, obtaining better prices on materials and supplies, protecting themselves from untrained operators, and lobbying with the government.

An association could also endorse certified well drillers and report non-certified drillers who are doing substandard work to the authorities. An association could order a higher quantity of PVC pipes and other materials than individual members could, which brings the price of materials down. Often the larger machine drillers control the supplies of materials and individual small orders tend to be very expensive.

The way forward

The manual drilling toolkit developed by UNICEF, Practica and Enterprise Works/VITA includes Technical Notes, Technical Manuals, Advocacy Materials, Mapping of suitable areas for manual drilling, Case Studies, and Implementation and Training Manuals. It is essential that these are viewed holistically if the aim of professionalizing and sustaining manual drilling is to be realized. Successful manual drilling operations that deliver sustainable water supplies to communities and support viable local micro, small, and medium manual drilling entrepreneurs and enterprises must consider technical, management, and financing issues to be successful. The reader is therefore encouraged to review the entire range of resource materials, keeping in mind that they have been developed as a set.

To date, the mapping of the potential for manual drilling has been undertaken with UNICEF support in over 12 African countries and in several of these countries the full professionalization process has been, or is being, implemented. The manuals within the toolkit include:

- Professionalizing the Manual Drilling Sector in Africa
- Understanding Groundwater and Wells in Manual Drilling
- An Inventory of Manual Well Drilling Techniques
- Improving Skills of Manual Drilling Enterprises: Business Management
- Financing Options for Low-Cost Well Drillers and Communities for Rural Water Supply

The toolkit can be accessed free-of-charge at: http://www.unicef.org/wash/index_49090.html

Acknowledgements

The authors would like to extend thanks to Silvia Gaya, Fabio Fussi, Arjen van der Wal and all the staff of UNICEF, Enterprise Works/VITA and Practica who contributed to the manual drilling initiative.

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