



Technology Recommendation Borehole & Hand Pump India Mark II Kapoeta North County – Eastern Equatoria South Sudan

How can we understand whether the India Mark II hand pump is a sustainable and scalable technology to provide rural water service in many payams in Kapoeta North County, and if it meets users' needs?

How can we capture valuable learning and present experiences, drawing together all actors involved in an effective scaling up of the hand pump technology for a lasting water service?

These are questions the Kapoeta North County Rural Water Service Board seeks to answer in collaboration with VNG and IRC through a Technology Check (using the Technology Applicability Framework (TAF)¹).

This Briefing Note captures the findings of the Technology Check on the India Mark II hand pump in Lolepan, Nadjé payam, Kapoeta North County.



Summary of conclusions and recommendations

- Demand in communities for hand pumps is high and the technology does satisfy the water demands of most if not the entire community.
- The hand pump technology in general is aligned with the national policies, strategies and standards.
- The present perceptions, attitudes and behaviours of the communities need to change to have their roles and responsibly on the hand pump accepted and made effective to get a lasting water service. This includes payment for water services, which is currently not the norm.
- Water users through Water Management Committees (WMCs) are responsible for daily operation and minor maintenance. However WMCs are often not present, and even if established not trained, although this is key for sustainability
- Government institutions exist to support rural water services. However, capacities and resources are insufficient to ensure this effectively.
- The current UNICEF-supported spare parts supply system will soon stop, creating a serious gap that needs to be filled by a stable, effective hand pump spare parts supply chain, possibly involving the private sector.
- The private sector in South Sudan does not produce the India Mark II hand pump or a derived product; however, several firms and organisations in the country procure the pump and its spare parts.

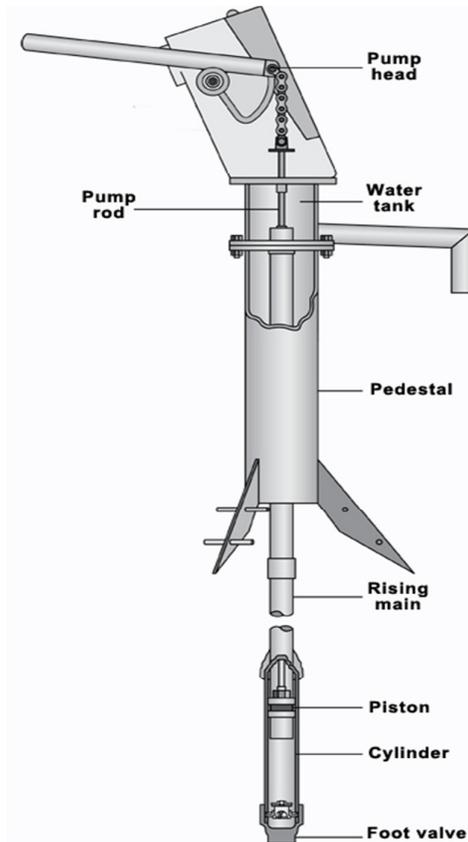


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Introduction borehole with hand pump in Kapoeta North County

Boreholes with hand pumps have been a common water supply for decades in South Sudan. During the civil war in the eighties and nineties, humanitarian aid organisations massively drilled boreholes and installed hand pumps, mainly India Mark II, a standard in those decades. In recent years, development-oriented partners assisted the local government in increasing the access to safe and reliable water supply. Where geo-hydrological conditions allow, population densities are not high, and no large scale cattle-watering is expected, the favourite technology remains boreholes with hand pumps. In areas with large herds of cattle, solar-powered pumping for higher water production is considered an alternative option. In Kapoeta North County, boreholes are predominantly equipped with India Mark II hand pumps. This manually operated pump can lift water from up to 50 metres and is designed to serve up to 300 people for a domestic consumption of 20-25 litres / person / day. It uses a piston housed within a cylinder to displace a column of water upwards to the surface through the rising main. The pump and spares are being manufactured in India, China and Uganda, amongst others.

The current indicative cost of an India Mark II hand pump in Kapoeta North County, including 50 metres of down-the-hole components, is approximately US\$1,000 (2014) or SSP 4,000. The total cost of the India Mark II hand pump plus a mechanically drilled borehole in the area is approximately US\$14,000 (2014) or SSP56,000. The annual Operational Expenditures (management, operations, minor repairs and maintenance) are estimated at around SSP2,500-3,500 (≈\$700-1,000) per year varying by intensity of use, or some SSP 4-6 per month per household. Without preventive maintenance, serious faults can develop that may be very expensive to fix.



Technology Check -Evaluation

A 6-person team composed of 4 members of Kapoeta North County and 2 VNG-IRC facilitators did the community data collection part of the TAF. VNG-IRC facilitators collected the 'provider' and government/regulator data through interviews with County staff.

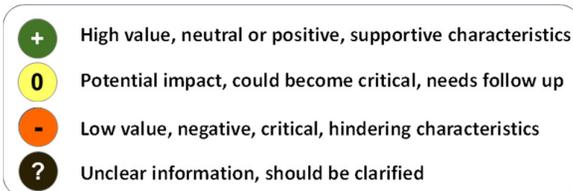
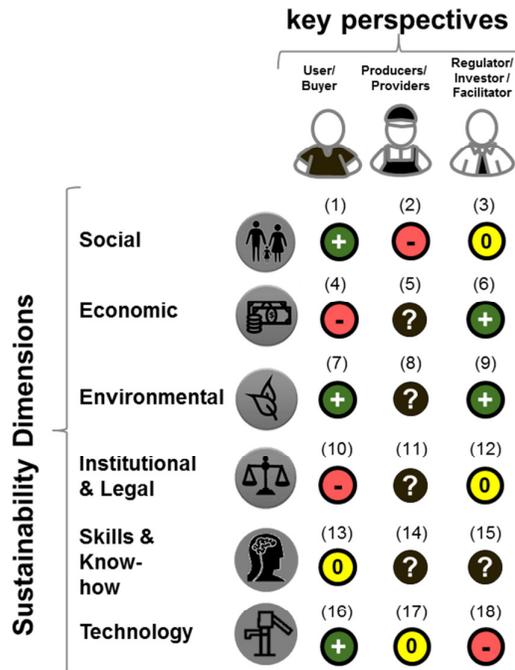
Results of Technology Check on the borehole & hand pump India Mark II in Kapoeta North County

The TAF was used to identify obstacles to the sustainability and scalability of this technology in rural areas of Kapoeta North County. The TAF was not used to make a judgment on whether the India Mark II is a good technology or not. The graphical profile below presents the result of the participatory review/scoring exercise with members of the County Rural



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Water Service Board and of one NGO, under the facilitation of IRC and VNG staff. The scoring was done using 6 sustainability dimensions and 3 stakeholder perspectives.



Social

There a strong demand from target users for this water technology, as the nearer alternative is a seasonal river. Current users are satisfied with the technology. However they do not make any regular contribution to cover operation and minor maintenance costs. The technology is usually supplied by a NGO or local government, who strongly subsidise it for community water supplies. Potential users are sensitised about the technology when they are already selected to get a water system and the technology is already selected. Until recently,

local communities had little exposure to various water supply technologies, hence limited opportunities for technology choices. Some communities in Najie payam, who now know what a solar-powered water system is, recently expressed their preference for hand pumps over solar pumps, as such systems attract many cattle owners from outside, inducing overcrowding at the water point, loss of animals... Some changes in attitudes and behaviours are required among local communities, so that they demand for safe water supply and are ready to pay for such service. These changes could be stimulated through awareness raising and by catering for watering of animals in the design of the water systems, so that these are more valued by cattle owners. However local government staff stated they lack skills and resources for these.

Economic-financial

Water users currently do not pay for the water they fetch, which is a serious risk for the water service to last. Although all costs of operation and minor maintenance are to be covered by the water users, they only contribute (usually in kind) when there is a need for a repair, mostly for contracting and paying a pump mechanic. Water users obviously cannot afford to pay for the full capital cost of this technology, and major maintenance costs are beyond what they are willing to pay. Nonetheless SSP 4-6 per month per household for operation and minor maintenance are affordable for the users. It is unknown whether the producer generates sufficient revenues from sales to cover costs such as product development, promotion, supply chain development, etc. Given the very low safe water access figures (approximately 34% in rural areas), the availability of groundwater, and the priority given to water services by government and many development partners, there certainly is a market for the India Mark II hand pump in the area, although its profitability is unclear. Capital costs and costs of major maintenance are strongly subsidised by government and NGOs.



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Environmental

The technology does not create any risk for the environment at community level and for the ground water resources. Risks of pollution during production in India or East Africa are unknown. The technology also does not present any risk to the users, and can be used under any climatic condition.

Institutional- organisational

The current O&M structure is clear: water users through the Water management Committee (WMC) are responsible for daily operation and minor maintenance, if necessary contracting a local pump mechanics, while the County is responsible for major maintenance. However, many water users expect the County to also pay for minor repairs. In addition, in practice this system is not fully in place. Most boreholes in Kapoeta North have no WMC, and even when established, WMCs often lack training. Having some pump mechanics on the pay roll of local government while some operate as private entrepreneurs is a confusing situation. Structured post-construction support to WMCs by the County or another body is lacking. The current level of O&M carried out on the visited water system is clearly very insufficient to keep this technology running in the long term. It is unknown how the producers/providers ensure that the technology and spares comply with production standards. There is no formal process for national government to validate a given water supply technology. The South Sudan Bureau of Standards has the mandate to regulate the quality of the parts; however it is unknown whether this is really done. Construction supervision for boreholes is often limited, and in practice no one is held accountable when the production or installation of the technology is poor.

Knowledge and Skills

Water users and WMCs have limited technical and managerial capacities to manage this water technology and carry out O&M, mainly because WMCs are not trained. Water users are all conversant with the operation of the technology, which only requires light guidance. Caretakers do require some training for carrying minor maintenance, while local mechanics are trained for maintaining and repairing it, although they do not have the necessary tools, which are kept at the County. Current capacities and resources at the County are insufficient for carrying out WMC initial and follow-up training, as well as other post construction support activities.

Technological

Water users are satisfied with the service provided by this technology, which is working well, is accessible anytime of the year and to almost everybody. Users who cannot use it due to physical reasons (old people, disabled...) are helped by other, for instance family members. Currently there is no viable supply chain in South Sudan for this technology. UNICEF gives spare parts to the State, who in turn sends them to the County, where they are stocked, far away from many end users. Usually, when there is a need for replacing a part, the County gives it to a pump mechanic who fits it. Water users do not pay anything for spares, only contributing to labour costs. The current supply chain cannot be seen as sustainable, and is 100% subsidised. If well used and maintained, the India Mark II hand pump has a lifespan of more than 10 years. However, water users tend to overuse the hand pumps (also for watering cattle), and little maintenance is done, with as a consequence many facilities completely down after 2-3 years. The South Sudanese sector has no responsible body to support the private manufacturer in the product development, and there is no need for it, as the India Mark II has been developed a long time ago.