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PRIMING THE PUMP: EXPLORING THE IMPACT OF SMART WATER PUMPS ON COMMUNITIES IN SOUTH AFRICA AND MALAWI, WHERE WATER ACCESS IS PROBLEMATIC.

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Drawing in particular on recent empirical work in South Africa and Malawi, this paper considers the potential that ‘SALT technology’ (sustainable, alternative, low-cost telemetry) has to help realize the goal of sufficient water for everyone by improving the functioning of existing infrastructure and by supporting swift and cheap access to information for all stakeholders. It is suggested that pursuing a dual approach (offering water service providers improved monitoring information, and making this information *publically* available) could result in a more efficient, responsive, transparent and accountable system of water allocation.

The paper focuses first on some of the major (physical, regulatory and legal) impediments to people’s access to sufficient water in these two countries. Second the physical challenges to, and potential of SALT technology is explored. Third the social context into which SALT technology would need to operate is considered; including the empowering potential of information generated by such technology, if received by the right people in the right ways. Finally the paper offers a practical vision of SALT technology in action, which is contextualized and sensitized to its particular hydrosociolegal situations.

A significant factor contributing to insufficient and unpredictable access to water in Africa is the high percentage of broken, inoperable water pumps. Previous studies have reported that between 20% and 50% of all hand-operated pumps installed in the African continent are out of use. Monitoring and maintenance of pumps is often ineffective, due in part to the high costs of routine site visits, and the limited resources of NGOs and developing states [1]. Furthermore inchoate water rights and overly complicated regulatory frameworks contribute to many people’s water-access problems. Issues around water quality, quantity, proximity and affordability also compound these problems [2].

The emergence of new telemetry technology that can *remotely* monitor water pumps constitutes a novel and cost-efficient alternative to undertaking regular sites visits. But to date, the use of telemetry for monitoring water applications across Africa has been limited. Key barriers have been identified, including the following:

- i. a lack of necessary support infrastructure;*
- ii. high costs of monitoring equipment and associated telemetry technologies;*
- iii. a lack of awareness of the technology and of it’s potential applications and benefits amongst local water practitioners*

Positively, recent developments and technological advances are addressing each of these obstacles. In particular, SALT technology has been developed specifically to monitor the

performance of water pumps and to communicate this information swiftly and cheaply using SMS messages.

SALT technology is being trialed in Malawi, through the NGO *Water for People* and the South African *Department of Water Affairs and Forestry (DWAF)* as well as the *Southern African Development Community (SADC)* are interested in its potential.

Initially it was envisaged that the recipients of this remote monitoring information would be only those directly responsible for and/or linked to the upkeep of pumps (for example in South Africa the relevant local municipality, or in rural Malawi the water-focused NGOs). But data on the performance of water pumps could also be made available (online or by SMS) to other stakeholders, including the communities where pumps are located, the media, and the wider public; focusing productive pressure for better water services and encouraging active stakeholder participation. Viewed from this angle perhaps the most significant potential of SALT technology lies in the key question of *who* receives the information generated and what they could do with it. Sending information on water performance to those directly involved in and responsible for pump maintenance could certainly be beneficial. Allowing pump performance to be remotely monitored could lead to quicker intervention and repairs than relying on periodic physical inspection and/or potentially delayed or unreliable reports from pump users. This may result in a cheaper, more efficient maintenance program and a more reliable water service. But this application of SALT would also create a closed loop of information, which could miss the transformative potential latent in this technology. Rather it is suggested that if disseminated to a wider, but targeted group of stakeholders and interested parties, this information could have sizeable transformative and enfranchising effects.

Consequently the paper will explore this key question in detail by focusing on the formal existing relationships between water-pump users and service providers (as well as the less formal, but no less developed, interaction of users as community members, neighbours etc.) in order to help understand and predict in what ways SALT could impact each stakeholder and how, where and by whom the telemetric information generated could be utilized to best effect.

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