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Factors influencing sustainability of communally-managed water facilities in rural areas of Zimbabwe

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ABSTRACT

Sustainability of point water facilities is a major development challenge in many rural settings of developing countries not sparing those in the Sub-Saharan Africa region. This study was done in Zimbabwe to investigate the factors influencing sustainability of rural water supply systems. A total of 399 water points were studied in Nyanga, Chivi and Gwanda districts. Data was collected using a questionnaire, observation checklist and key informant interview guide. Multi-Criteria analysis was used to assess the sustainability of water points and inferential statistical analysis such as Chi square tests and Analysis of Variance (ANOVA) were used to determine if there were significant differences on selected variables across districts and types of lifting devices used in the study area. The thematic approach was used to analyze qualitative data. Results show that most water points were not functional and only 17% across the districts were found to be sustainable. A fusion of social, technical, financial, environmental and institutional factors was found to be influencing sustainability. On technical factors the ANOVA results show that the type of lifting device fitted at a water point significantly influences sustainability ($F = 37.4$, $p < 0.01$). Availability of spare parts at community level was found to be determining the downtime period of different lifting devices in the studied wards. Absence of user committees was found to be central in influencing sustainability as water points that did not have user committees were not sustainable and most of them were not functional during the time of the survey. Active participation by communities at the planning stage of water projects was also found to be critical for sustainability although field results showed passive participation by communities at this critical project stage. Financial factors of adequacy of financial contributions and establishment of operation and maintenance funds were also found to be of great importance in sustaining water supply systems. It is recommended that all factors should be considered when assessing sustainability since they are interrelated.

Contents

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1. Introduction

The provision of safe drinking water is a crucial component for the world to eradicate poverty and improve public health. As part of the Millennium Development Goal (MDG) 7, halving the proportion of people without sustainable access to safe drinking water, and basic sanitation by 2015 was one of the targets (United Nations, 2011). Although it was declared that the drinking water part of the goal was met (WHO AND UNICEF, 2014) this is not true globally as some regions still lag behind (WHO AND UNICEF, 2015). Zimbabwe is one of the countries which failed to meet the target on halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015. According to WHO AND UNICEF (2015), 77% of Zimbabwe's population had access to improved water sources in 2015. Notably, the rural areas of the country had 67% of their population having access to improved water sources (WHO AND UNICEF, 2015). This is a clear indication that, despite the global improvements in water access, Zimbabwe still bears the burden of poor water access.

Despite the disparities in water access, it is also worthwhile to note that the declaration of success ignores two key components of water supply, which are provision of safe water and maintaining sustainable supply systems (Alexander et al., 2015). To meet the drinking water part of the goal, it has been noted that development practitioners in the sector were putting more attention on building new facilities than ensuring their sustainability (Katz and Sarah, 1997; Montgomery et al., 2009). Little investments have been done in operation, maintenance and repairs of the installed infrastructure (Hutton and Bartram, 2008). It has been estimated that only 5–20% of the total water supply project costs are allocated for Operation and Maintenance (O&M) against the recommended 60% for water supply systems to be sustainable (Hutton and Bartram, 2008). Limited or absence of maintenance budgets has compromised sustainability thus depriving communities the benefits of improved water systems. In September 2015, the UN General Assembly developed a stand-alone water goal (number 6), “Ensure the availability and sustainable management of water and sanitation for all” in its Sustainable Development Goals (SDGs) (United Nations, 2011). This development shows that sustainability of water supply systems is still a challenge even after the MDGs.

Numerous studies have shown that sustainability of water supply facilities is a major development challenge in many rural settings of developing countries not sparing those in the Sub-Saharan Africa region (Harvey and Reed, 2004; Hoko and Hertle, 2006; Tadesse et al., 2013; Spaling et al., 2014; Alexander et al., 2015). In this region non-functional water supply points ranging from 30% to 70% have been reported on in the last two decades (Hoko et al., 2009; Mwnagi and Daniel, 2012; Dube, 2012). In Zimbabwe Hoko et al. (2009) noted that 38% of the water supply systems were unsustainable in Mt Darwin District, while Dube (2012) observed 60–70% in Gwanda District. Unsustainable water supply systems usually have long downtimes, high breakdown frequencies, inadequate water supplies, and they are not reliable. These high levels of non-functional water supply systems compromise access to potable water considering that it is a basic human right. This also raises the question why rural water points fail and are abandoned within the very communities that desperately need them (Ihuah and Kakulu, 2014). Therefore there is need to evaluate and put measures for achieving sustainability of the provision of water supply facilities so that the long-term benefits of the investments can be achieved.

Sustainability of water supply services is influenced by a number of factors which have been discussed in numerous rural water supply service discourses. Authors who have discussed these factors include Harvey and Reed (2004), Hoko et al. (2009), Montgomery et al. (2009), Smith (2011), Quin et al. (2011), Peter and Nkambule (2012), Dube (2012), da Silva et al. (2012), Tadesse et al. (2013), Spaling et al. (2014) and Alexander et al. (2015). Broadly, sustainability factors that influence water supply systems have been classified as being economic/financial, social, institutional, technological and environmental (Whittington et al., 2008; Montgomery et al., 2009; Spaling et al., 2014). Different authors have used varying combinations of these factors when assessing sustainability. Those who have considered several factors argue that sustainability is complex and should be assessed in a holistic approach (Carter et al., 1999; Harvey and Reed, 2004; Mays, 2006; Amjad et al., 2015). When Carter et al. (1999) presented these factors as a sustainability chain; they noted that the failure of any one of the links endangers the entire enterprise. On the other hand, Harvey and Reed (2004) presented the sustainability factors as building blocks. The authors emphasized that water facilities will not be sustainable by simply piling these blocks on one another; instead, they must be considered carefully in relation to each other in a holistic approach. da Silva et al. (2012) support the importance of assessing sustainability in a holistic approach since investment in one sustainability factor, for example social capital can enhance other factors such as technical capacity. This shows the importance of integrating all sustainability factors into a multi-faceted approach that recognizes their interrelatedness so that benefits from the water supply facilities are sustained over time (Spaling et al., 2014).

It is against this background that this paper seeks to analyze factors that are influencing sustainability of communally managed water supply facilities in rural areas of Zimbabwe. An

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