

Challenges of Water Supply Management in Rural Communities

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Introduction: Globally, management of rural, small community drinking water supply faces a lot of hurdles. According to the Millennium Development Goal (MDG) report, disparities in access to safe drinking water remain between rural and urban population. A systematic review was conducted on the challenges of rural drinking water supply management from source to tap. The aim of the review is to discover best practices and explore the different strategies in small rural communities' water supply management.

Methods: The review searched three online databases, Ovid, Web of Science and Cochrane Library for studies that evaluated rural drinking water supply or small-community water supply managements using 4 groups of key terms; "evaluation or assessment", "management or intervention", "drinking water or water supply", and "rural or small communities".

Selection and exclusion criteria:
Scope covers management between source to tap. Include any study design. Papers must have;

- i) a clear description of the intervention being studied
- ii) a clear description of the evaluation method used

Results: In total 15 papers were selected, consisting of 3 cross sectional studies, 2 case studies, 2 longitudinal studies, 3 quasi experimental and 5 cost effectiveness or cost benefit analysis modelling. Selected studies included 11 different countries involving almost all types of improved water supply technology and 31, 094 different water points. Positive management traits identified included committees with regular servicing ($P < 0.01$) and periodic financial audit ($P < 0.01$). Programs involving intervention have 42% higher percentage of functional water systems compared to control. The papers also showed cost effectiveness and positive cost benefit of proper rural water managements.

Alexander et al.: Mean difference of functional water points scoring (higher score means better functionality)

Management Characteristics	β	CI	P
Community consulted about location	-1.40	-2.60 - -0.19	0.02
Committee has regular meetings	1.27	0.20-2.33	0.02
Good record keeping	2.60	0.72-4.42	0.01
Periodic financial audit	2.69	1.44-4.22	< 0.01
Caretaker	1.82	0.46-3.17	0.01
Caretaker receives compensation	1.30	0.17-2.42	0.03
Committee can do minor repairs	3.00	1.03-4.96	0.01

Eder et al.: Status (functional condition) and sustainability (state of maintenance and repair) score for community and household water and sanitation infrastructure six years after project: intervention versus control communities

Infrastructure	Intervention	Control	Difference (%)
Community water system			
• Status	1.86	3.20	41.90
• Sustainability	1.87	2.67	30.00
Household water and sanitation facilities			
• Status	2.40	3.44	30.20
• Sustainability	2.60	3.74	30.50

Discussions/Conclusion: The review suggests that sustainability of rural water supply system depends on certain positive management aspects and effective management committees. It also showed that rural water interventions should be hands on with a sense of ownership to maintain functionality. The benefits of rural drinking water management were also shown to outweigh the cost.