

# Safe drinking water still a dream in rural areas of South Africa. Case Study: The Eastern Cape Province

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## Abstract

From October to November 2004, and from July to September 2005, a survey of 55 plants was conducted in five District Municipalities (Cacadu, Chris Hani, Amathola, Ukhahlamba and O.R. Tambo) of the Eastern Cape Province, with the aim of examining the disinfection practices used in small rural systems of the Eastern Cape and their effect on the quality of drinking water they supply to the communities.

Eighty six percent of the visited plants were treating surface water while 7% were treating groundwater and another 7% were treating both ground- and surface water. The majority of plants surveyed employed some variation of conventional treatment (coagulation, flocculation, sedimentation, filtration, chlorination). Turbidity values in 55% of the plants were within the acceptable SABS limits while the other 45% showed high values.

Out of the 55 surveyed plants only 18% complied with the SABS recommended limits in terms of microbiological quality. The major factors that contributed to high bacterial numbers were high turbidity and inefficient chemical (coagulant and chlorine) dosing, which led to low chlorine residuals. It was also noted that although some plants had low bacterial numbers at the point of treatment, bacterial re-growth occurred in the distribution system, thereby compromising the quality of water at the point of use.

The worst technical problems encountered tended to be at the newly commissioned or upgraded plants where properly trained operators had yet to be appointed or where the existing staff lack proficiency in the use of the upgraded systems or why certain modifications to the treatment process were being made.

Operators were lacking in the required technical knowledge such as flow rate and chemical dosing to effectively execute their duties. Lack of communication between consultants, operators and municipal officials on technical issues relating to plant operation appeared to be a problem.

The results of this study gave conclusive evidence that rural water treatment plants are still failing to produce safe drinking water.

**Keywords:** safe drinking water, failure, Eastern Cape, rural areas

## Introduction

Access to safe drinking water is a fundamental human need and therefore, a basic right. Contaminated water jeopardises both the physical and social health of all people and it is an affront to human dignity (WHO, 2003). The Water Decade has been preoccupied with construction and expansion of supplies and it is only in the latter part of the decade that more attention is being given to the investigation, protection and control of the installations, which supply drinking water Lloyd and Bartrams (1991). The fundamental responsibility of a public water supply is to provide safe drinking water that is adequate in quantity and acceptable quality to each consumer.

Prior to 1994, an estimated 30 to 40% of South Africa's population (approximately 14 to 18 m. people) was without adequate water supply services. As of 2004, 10m. people have been supplied with drinking water. However, despite the significant improvements made by government in water services provision, some 5 m. people are still obtaining water from rivers

and springs Kasrils (2004). While the South African government implemented many rural water supply schemes under the National Reconstruction and Development Programme, where rural water supply existed, drinking water is often of poor quality and considered unsafe.

Studies have shown that the majority of small water works in South Africa have difficulty in providing adequate treatment and disinfection with the result that consumers are at risk of waterborne diseases even from treated water supplies Mackintosh and Colvin (2002); Momba et al. (2002; 2003); Swartz (2000). The Eastern region of the Eastern Cape features various nodes where water resources combine with a well-developed system of purification plants and bulk water supply networks. These allow for provision of water services of a standard contrasts with that in the province's rural territories, where water treatment and supply facilities remain underdeveloped. Many rural settlements currently have only rudimentary water supply facilities or have access to potable water supply that falls below the minimum quality or quantity standards set by the government Beyl and Associates (2003/2004). Small communities face the greatest difficulty in supplying water of adequate quality and quantity because they have small customer bases and therefore often lack the revenues needed to hire experienced managers and to maintain and upgrade their water supply facilities. Inter-

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