Understanding Freshwater Quality Problems in a Changing World
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Groundwater pollution and the safe water supply challenge in Cotonou town, Benin (West Africa)

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Abstract Environmental change has impacted water systems inducing groundwater pollution in the town of Cotonou, in Benin, West Africa. Accordingly, it is important to improve the understanding of the drinking water supply problem, focusing on key aspects of the pollution problem and alternative approaches to the provision of safe water for human consumption. This study was based on the integration of existing literature, physicochemical and bacteriological analyses, assessment of drinking water quantity and the returns from participative investigations. Water quality standards in Benin reflect those set by the World Health Organization (WHO). The results of the study suggest that the shallow aquifer (depth less than 2 m) is more polluted by wastes and often by septic tanks situated less than 5 m from water sources. Groundwater mineralization depends on human activities, induced recharge and saltwater intrusion. Bacteria counts frequently exceed drinking water guidelines and standards (0 coliform counting units (CFU)/100 ml). Given these pollution problems, the shallow Quaternary aquifer is excluded for drinking water supply which is restricted to the Continental Terminal aquifers on the Plateau of Allada. Sustainable safe water supply is dependent on groundwater quality protection using an ecosystems approach, deep aquifer water extraction and rational water use by multiple consumers.

Key words Cotonou, Benin; groundwater quality; ecosystems approach; safe water; sustainable potable water supply