



**HAL**  
open science

# Groundwater resources of Burundi. New elements and decision making tools

Alexis Gutierrez, Jean-Marie Barrat

► **To cite this version:**

Alexis Gutierrez, Jean-Marie Barrat. Groundwater resources of Burundi. New elements and decision making tools. 35th International Geological Congress : IGC 2016, Aug 2016, Cape Town, South Africa. hal-01307031

**HAL Id: hal-01307031**

**<https://brgm.hal.science/hal-01307031>**

Submitted on 26 Apr 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Groundwater resources of Burundi. New elements and decision making tools.

Gutierrez, A.<sup>1</sup>; Barrat J.M.<sup>2</sup>

<sup>1</sup>BRGM, BP 36009, 45060 Orleans Cedex 2. France. a.gutierrez@brgm.fr

<sup>2</sup>JMB Consult., La Servantie, 19700 Saint-Salvador, France. barratjm@gmail.com

Burundi, which stands just below the equator line, is a small (28 000 km<sup>2</sup>) mountainous country with contrasted elevation (between 772 m in the rift area up to 2 670 m.a.m.s.l.), and rainfall ranging from 700 to 2 200 mm/y. On geological point of view, Precambrian (basement) rocks are prevailing (up to 90% of granite, schist and quartzite), covered from time to time with alluvial formations in the inland valleys and the collapse zones related to the East-African rift (Imbo area in the eastern and northern edge of the Lake Tanganyika and in the Moso area in the south-eastern part of the country, bordering Tanzania).

The way of tapping water resources is mainly through springs : 22 000 springs are tapped for water supply compared to no more than 30 boreholes in 2010. Recent studies [1],[2],[3], however, prove that groundwater resource should not be neglected. A groundwater potential map for the country

(figure 1) was carried out in 2011 at the scale of a quarter million, which was validated by a series of boreholes in 2013 & 2014. Due to the tectonic activity in the region (rift), the basement is well fractured and proper siting of boreholes along fault zones result in high transmissivity (100-1000 m<sup>2</sup>/d), in addition to the high development of the weathered zone in granites & schists (up to 100m thickness) which provides high storativity. However, faulting system also results in aquifer compartmenting leading to variable sustainability. The area of Gitega is located in such a structure where water abstraction needs to be monitored carefully to avoid overexploitation.

Water obtained from boreholes is generally of good quality, except for iron and manganese in some places.

Inventory of springs in the Ngozi region [4] gives insights of how rainfall water infiltrates and incidentally becomes mineralized.

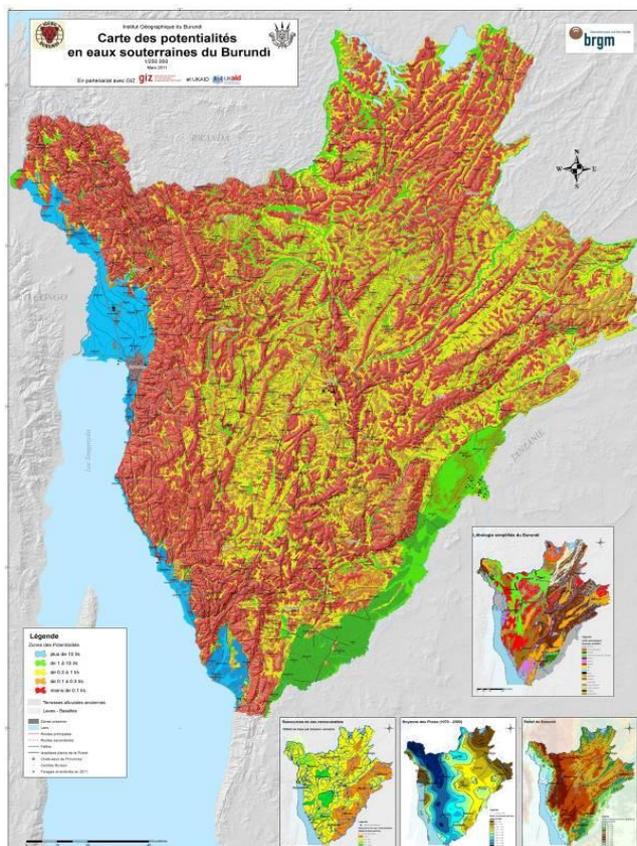


Figure 1: Map of groundwater potential of Burundi [1]

## References:

[1] Barrat J.M., Mardhel V., Gutierrez A., Pinson S., Buscarlet E., Lallier S., 2011 : Programme Sectoriel Eau – Burundi - Cartes des Potentialités en Eaux Souterraine BRGM/RC- 59751-FR

[2] Barrat J.M., Forages de Karusi (Burundi) - Interprétation des pompages, 2014, JMB\_Concult

[3] Barrat J.M., Supervision des opérations de construction de piézomètres dans les communes de Kirundo, Gitega et Rumonge au Burundi, 2014, JMB\_Concult

[4] Gutierrez A., Mardhel V., Meilhac A. (2015) – Sources de la Province de Ngozi (Burundi). Critères pour un réseau de suivi. Rapport final. BRGM/RC-64509-FR, 46 p., 27 ill.,