Paper Number: 525

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

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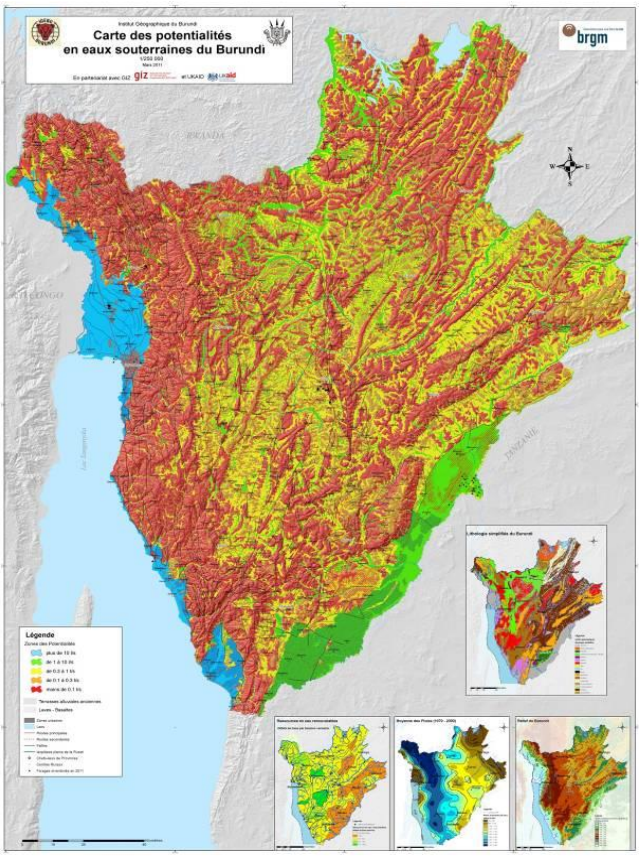
Burundi, which stands just below the equator line, is a small (28 000 km^2) mountainous country with contrasted elevation (between 772 m in the rift area up to2 670 m.a.m.s.l.), and rainfall ranging from 700 to 2 200 mm/y. On geological point of view, Precambrian (basement) rocks are prevailing (up to 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^2/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_Consult

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

[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.,