

GROUNDWATER SOURCES ON THE BRINK OF EXTENSIVE ABSTRACTIONS AND OVERDRAFT IN RWANDA: CURRENT SITUATION, FUTURE IMPLICATIONS AND POSSIBLE MITIGATION MEASURES

M. Ndekezi¹, J. W. Kaluli² and A. Gariy³

¹*Institute for Basic Sciences, Technology and Innovation, Pan-African University, Nairobi, Kenya*

^{2,3}*College of Engineering and Technology, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Nairobi, Kenya*

Email: *mosnde06@yahoo.com*

Abstract

This paper constitutes a review of the groundwater situation in Rwanda, a country with an area of 26,338 km², that receives about 5 billion cubic metres of rainwater per year (1,000 L/person/day) and yet is classified as a water-stressed country. Rwanda faces environmental management challenges including land degradation, water pollution, deforestation and erosion, which are responsible for siltation and sedimentation of rivers and lakes. With a population growth rate of about 2.4% per year (2016 est.) and density of 471 inhabitants/km² (2015 est.), ranked as 3rd in Africa and 24th in the World, the country has undergone an increasing water demand. Rwanda suffers uneven distribution of water resources, inadequate financing, under-developed water resources database and information systems, inadequate cooperation in the management of trans-boundary waters, and limited stakeholder participation in matters of water management. Surface water exploitation infrastructures like water treatment plants have been constructed in the last two decades, but have not been adequately upgraded to meet the current demand. The uncovered water demand-supply gap has accelerated the use of water abstracted from groundwater aquifers. With the help of international NGOs, around 5,651 wells / boreholes have been constructed but none of them is linked to a viable groundwater recharge strategy. There is need to create public awareness about sound groundwater management practices and incorporate groundwater management strategies into the National Water Resources Master Plan (NWRMP). It is also necessary to invest in institutional capacity development in Trans-boundary Water Management (TWM). These new arguments raised in this present review are intended to stimulate novice researchers, water management experts, NGOs and decision-makers to take the appropriate action in this current concern.

Key words: Rwanda, groundwater abstractions, groundwater overdraft, recharge, surface water, effective water resources management