

Assessment of the hydrogeological potential, groundwater quality and intrinsic vulnerability of the Bero river basin – Namibe (Angola)

Summary

Angola is a country endowed with vast surface and groundwater resources, but their distribution is not uniform across the nation, and their management and exploitation have often been inefficient due to various factors. These include a lack of scientific information regarding hydrological potential and conditions, the near absence of information about Angolan hydrogeology, a lack of monitoring data (meteorological, hydrological, and hydrogeological), and the absence of a comprehensive water point inventory database with corresponding geological logs.

For a better understanding of the vulnerability of southern Angola to drought, the World Bank and other international institutions (UNICEF, Millennium Challenge, FAO) have compiled various reports aimed at providing a practical approach and concrete measures to support the Government of Angola in shifting its paradigm to address drought and enhance climate resilience. To present a clear view of the problem and its solutions, the report focuses on understanding the structural causes of water access vulnerability throughout the region. It provides a strategy for the water sector to build resilience to droughts and climatic variability, which is also susceptible to intensification with global warming.

This study identified four primary causes of drought vulnerability in southern Angola. One of them relates to (i) the lack of information on the state of water extraction points and deficient knowledge about the potential of water resources. Another cause emphasizes (ii) increased investment in training and conducting comprehensive hydrogeological studies and Watershed Management Plans to plan sustainable investments across the entire basin and promote more resilient management of water resources and access. Additionally, the study highlights the (iii) need for the implementation of monitoring systems (in situ and remote sensing) to monitor groundwater and surface water resources in terms of both quality and quantity. Lastly, it recommends (iv) the integration of existing and new information for the strategic use of aquifers in the region.

In practical response to some conclusions and recommendations from these international institutions, including the World Bank report and the pleas of affected communities, there is a perceived necessity to conduct a study on the "Assessment of Hydrogeological Potential, Intrinsic Vulnerability, and Hydrochemistry of the Bero River Watershed – Namibe."

This study aims to facilitate the strategic and resilient utilization of surface and groundwater resources in the mentioned basin, crucial for water supply in the Moçamedes region. Finally, the collected data will be interpreted and used to: characterize the geology and define the hydrogeology of the study area; define the local and regional processes of groundwater recharge and discharge, and surface- groundwater interaction; identify groundwater dependent ecosystems; characterize the hydrochemistry of the basin; define the conceptual model; estimate groundwater resources; define measures for the protection and sustainable management of water resources.

Keywords

Groundwater vulnerability, water resources, salinization, sustainable development, climate change, river Bero (Namibe, Angola).



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