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From the national hydrogeological map to regional ones. How to identify the suitable level of detail to work with? An application in Kunene and Omusati Regions in Northwestern Namibia

Groundwater is a critical resource in Namibia, particularly in the Kunene and Omusati Regions, which are among the driest in Sub-saharian Africa. As such, hydrogeological mapping is essential to ensure sustainable use and management of this resource.

The hydrogeological map of Namibia was updated recently (2021). However, details of a 1:1M map are too coarse for regional groundwater management. An on-going study of groundwater potential assessment in the two regions required downscaling of the information to 1:250 000. This work made use of geological maps 1:250 000 from the Geological Survey of Namibia, about 430 selected wells including 20 recent boreholes, 117 reinterpreted pumping tests, some existing reports from private companies, academic works including a PhD thesis, interviews with local water resource experts and statistical analysis of 6 500 wells from the National Groundwater Database (GROWAS II) maintained by the Ministry of Agriculture, Water and Land Reform (MAWLR).

The regional hydrogeological map obtained was then associated to the recharge evaluated in a separate task of the same project in order to assess the available groundwater sustainability. By assessing abstraction costs and water demand, the work carried out gives insights of areas where groundwater abstraction can be increased or restricted to ensure sustainable use.

As conscientious and serious as this study may be, it does not replace a master plan but allows a global vision of the development potential of groundwater at a regional scale.

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Keywords: Namibia, Kunene, Omusati, groundwater potential, economic assessment

Topic selection: Scale aspects of groundwater flow, biogeochemical and transport systems

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