Hydrogeological Map of Zambia
Lusaka Province
First Edition 2012

Mwembeshi and Chongwe

1 : 250,000

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Prepared as a technical co-operation project between the Governments of Zambia and the Federal Republic of Germany

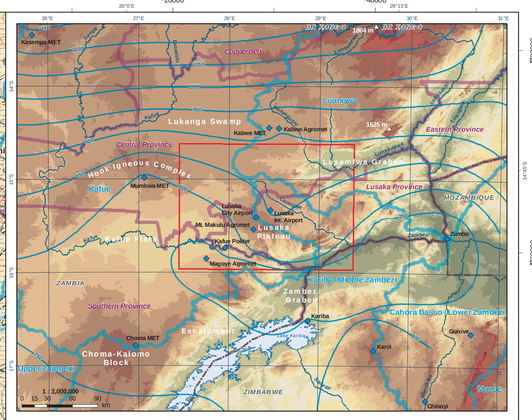
Reference and Data Source:
Accompanying brochures:
- A. Nick, R. Mweene, R. Bäumle (2012): Groundwater Resources of the Mwembeshi and Chongwe catchments, including the Lusaka region. -A Manual with Explanations for the Use of the Hydrogeological Maps and Vulnerability Map-. Ministry of Lands, Energy and Water Development, Department of Water Affairs and Federal Institute for Geosciences and Natural Resources; Lusaka.
- R. Bäumle, A. Nick, B. Shamboko-Mbale, C. Siwale (2012): Groundwater Resources of the Mwembeshi and Chongwe catchments, including the Lusaka region. -A Brief Description of Physiography, Climate, Hydrology, Geology and Groundwater Systems of the Area-. Ministry of Lands, Energy and Water Development, Department of Water Affairs and Federal Institute for Geosciences and Natural Resources; Lusaka.

BOREHOLE INFORMATION: - Department of Water Affairs: Groundwater Database; Groundwater Resources for Southern Province Project (GRESP), December 2011

LITHOLOGY: - Geological Map 1 : 100,000; Geological Survey Department, Lusaka / Geological Survey, N. Rhodesia*; 1427NE (1962)*, 1427SW (1998), 1427SE (1970), 1428SW (1964)*, 1428SE (1994), 1429SW (1992), 1527NE (1962)*, 1527NW (1955)*, 1527SE (1963)*, 1528NE (1968), 1528NW (1963)*, 1528SE (1967), 1528SW (1963)*, 1528WW (1967)*
- Geological Map 1 : 250,000; SD-35-15 (1984)
- Geological Map of Zambia 1 : 1,000,000 (1981); Edition 2

TOPOGRAPHY: - Topographic Map 1 : 50,000; Survey Department Lusaka; 1427C2 (1966), 1427C4 (1966), 1427D1-D3 (1966), 1427D4 (1971), 1428C1 (1989), 1428C2 (1990), 1428C3 (1992), 1428C4 (1988), 1428D1 (1984), 1428D2 (1975), 1428D3 (1992), 1428D4 (1963), 1429C1-C4 (1972), 1527A2 (1972), 1527A4 (1974), 1527B2 (1973), 1527B4, 1527D2 (1980), 1528A1 (1974), 1528A2, 1528A3 (1972), 1528A4 (1988), 1528B1 (1990), 1528B2 (1972),1528B3 (1981), 1528B4 (1972), 1528C1 (1963), 1528C2 (1976), 1528C3 (1988), 1528C4 (1986), 1528D1 (1989), 1528D2 (1990), 1528D3 (1980), 1528D4 (1988), 1529A1 (1972), 1529A2 (1989), 1529A3-A4 (1972), 1529C1-C2 (1973), 1529C3 (1980), 1529C4 (1959)
- Topographic Map 1 : 250,000; Surveyor-General, Lusaka; sheet numbers and publication date: SD-35-15 (1986), SD-35-16 (1991), SD-35-11 (1973), SD-35-12 (1974)
- LANDSAT ETM, Resolution 30m, date 2002-02-22, (bands 7,4,1), WGS 1984, UTM-Zone 35, Datum: D_WGS_1984;
- QUICKBIRD, Resolution 60cm, date 2007, 2008; -WORLDVIEW, Resolution 50cm, date 2007, 2008
- Elevation contours derived from DEM, based on Shuttle Radar Topography Mission (SRTM) data;
- DEM grid resolution is approximately 90m by 90m (3 arcsec)

Geometry: Transverse Mercator Projection, Zone 35; Spheroid: Modified Clarke 1880



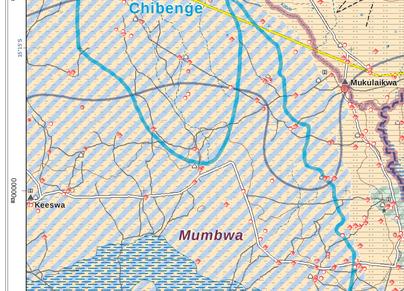
Rainfall

Source: Metrological Department, Zambia; (long-term data exceeding 25 years)

- rainfall station
- 752 mean seasonal rainfall in mm
- catchment boundary of surface water

Elevation [m a.s.l.]

< 400	> 900 - 1000	>1500
> 400 - 500	>1000 - 1100	
> 500 - 600	>1100 - 1200	
> 600 - 700	>1200 - 1300	provincial boundary
> 700 - 800	>1300 - 1400	international boundary
> 800 - 900	>1400 - 1500	current map



AQUIFER CATEGORY

Aquifer in which flow is mainly intergranular

- local or discontinuous productive aquifer or extensive but only moderately productive aquifer

Fissured aquifer, including karst aquifer

- extensive and highly productive aquifer
- local or discontinuous productive aquifer or extensive but only moderately productive aquifer

Stratum forming insignificant aquifer

- minor aquifer with local and limited groundwater resource
- stratum with intermediate characteristics

Piezometric surface, contour line in meters [a.s.l.], contour interval 50m

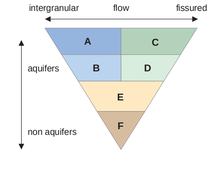
- 500 validated
- tentative

Reliability: This map provides an overview of the hydrogeological setting at the respective scale. Siting of successful boreholes requires more detailed investigations by a professional hydrogeologist.

1 : 250,000

0 10 20 30 40 km

1 centimeter equals 2,5 kilometers



Aquifer classification system (after Struckmeyer & Margat, 1995). For further explanations: A. Nick et al. (2012)

HYDROLOGY

- dam, lake, lagoon, reservoir
- pan
- swamp or marsh
- dambo (type of shallow wetland)
- main river
- large river with perennial / seasonal or intermittent runoff
- river or large stream with perennial / seasonal or intermittent runoff
- stream with perennial / seasonal or intermittent runoff
- catchment boundary of surface water
- Lufua sub-catchment boundary of surface water with name
- regional groundwater flow direction

GROUNDWATER FEATURES

- group (3-12) of water points
- borehole
- borehole with hand pump
- borehole with submersible pump
- hand dug-well with hand pump
- hand dug-well usually with bucket and windlass
- windpump
- Chimyunya thermal spring

TECTONIC LINEAMENT

- fault
- fault, interferred

TOPOGRAPHY

- Kafue district center or other large settlement
- Chipangula hut, village
- ★ points of interest (mission, agricultural station)
- NISIR research institute
- school, outside Lusaka District
- health facility
- trunk road
- main road
- district road
- street, farm road, track
- railway
- contour line in meter [a.s.l.], contour interval 100m
- Monze district boundary with name
- Central provincial boundary with name
- international boundary

Authorities: This map is not an authority on the delimtation of cadastral boundaries.

LITHOLOGY

Sedimentary Rock

- unconsolidated or semi-consolidated gravel, sand, silt and clay
- limestone / dolomite
- sandstone and conglomerate – example: aquifer category C –
- undifferentiated sandstone, siltstone and mudstone
- mudstone, siltstone and shale
- sedimentary (clastic)

Metamorphic Rock

- marble; meta-carbonate: Cheta-, Lusaka-, Nyama Formation
- marble, meta-carbonate and calc-silicate rock (undifferentiated)
- gneiss and granite-gneiss
- schist, slate, phyllite and quartzite
- psammite or pelite
- metamorphic rock (undifferentiated)

Igneous Rock

- basic extrusive (basalt)
- extrusive (undifferentiated) – example: aquifer category C –
- basic to ultra-basic intrusive
- acid to intermediate intrusive
- undifferentiated